KNOWLEDGE ORGANISER BOOKLET

YEAR 9 – CYCLE 2

2025-2026

Name:

Tutor Group:

Contents

Instructions for Use

For all of your subjects, there are certain **facts** that you **need** to know in order for you to best understand the content you study in lessons.

In this booklet are ***Knowledge Organisers*** for each subject which contain the core concepts that you have to know to be successful in your lessons.

The **first 15 minutes** of Home Learning is the same in all subjects (apart from Maths) and should be completed in your single **Home Learning exercise book**:


Look: read a specific section of the *Knowledge Organiser*.


Cover: cover it over or put it to one side;


Write: from memory, write out as much of the information as you can remember for that section;


Check: check back with the *Knowledge Organiser*. Anything missing or incorrect, add in purple pen.


Review: information you didn't recall the first time you may wish to check in a different format, such as repeating the process or creating revision cards.

The next lesson, your teacher will check that you have completed this process and you will be quizzed in your subject lesson to see what you can recall.

Instructions for Use : Example

Show My Homework **for Geography says: 'Knowledge Organiser: How to Read Grid References'.**

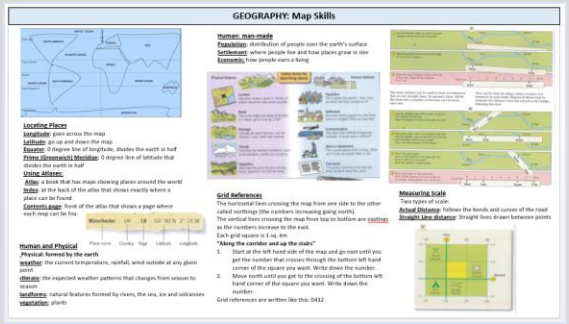
1. L**OOK:** carefully read the section of the *Knowledge Organiser* which you are learning.

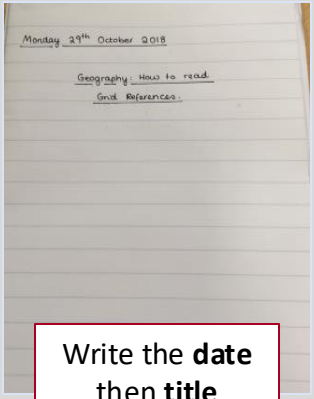
2. **COVER:** cover it over or put it to one side.

3. **WRITE:** write out as many details as you can from memory.

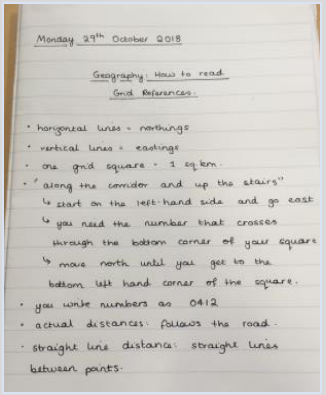
4. **CHECK:** check back over your answer with the *KO*. Anything which is missing or incorrect, add in in **purple pen**.

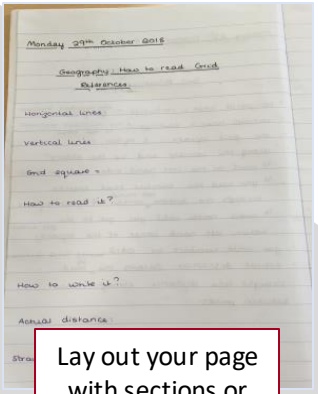
5. **REVIEW:** if you had significant gaps or parts you didn't understand, repeat the process from Step 1.



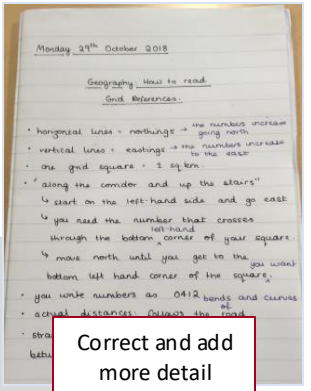


Write the **date** then **title** (**subject: focus**)





Lay out your page with sections or questions to help



Correct and add more detail using your purple pen.

sparx is your Maths homelearning

You do not have a knowledge organiser for maths. This is because the best way to remember and understand mathematics is to do it. Write your Sparx password in the space below so you don't forget it.

Sparx username: ……

Sparx password: ……

How do I log on?

Go to www.sparxmaths.uk. Select ***Kingsbridge Academy*** and enter your username and password.

What do I have to do each week?

Complete all of your Compulsory Section Sparx homework and get it 100% correct. If within your hour of home learning time you should complete the target and optional sections which are designed to help you make better progress in Maths.

How long should it take?

Sparx will adjust your homework so it should take about 1 hour. If you find yourself taking longer than this you should make sure you are coming for help on the difficult bits.

When should I do it?

You should complete your Sparx homelearning in the 4 allocated 15 minute slots in your homelearning timetable

What if I get stuck or can't do it?

You can watch the videos, ask a friend or parent or ask a maths teacher (in person or by email).

Why do I get different questions to my friend?

Sparx creates a custom homework just for you – because you are an individual. We are really pleased that we are able to offer you personalised homework.

Why do I have to do 100%?

We care about you and believe that you deserve to do well in maths. Students who do all questions learn more and get better results.

Year 9 Cycle 2 English: 'Remains' – Knowledge Organiser

What happens in the poem? The speaker and two other soldiers are sent to tackle some looters who are robbing a bank. They open fire on a looter who is running away. The looter is seriously wounded He is carried away in the back of a lorry. The soldier has to walk past the blood stain left on the ground week after week. He returns home and is haunted by the memory of what he has done, reliving it again and again. He drinks and takes drugs in an attempt to forget what happened. However, he is unable to forget the looter and what he did. The memory remains stuck in his mind.

What is the context of the poem?

- Simon Armitage wrote 'Remains' (and other poems) for a Channel 4 programme called 'The Not Dead'.
- He has never been to war himself and has never been a soldier.
- To write the poems, he interviewed a number of soldiers who have survived war (in Iraq, Afghanistan, the Falklands etc.) i.e. the 'not dead'.
- The poems show the suffering soldiers experience long after wars have finished.
- 'Remains' is heavily based on the experience of Guardsman Tromans who fought in the Iraq war.
- Tromans shot a looter in Iraq and suffers from PTSD.

What is the significance of the title? The poem explores how the traumatic experience of war REMAINS with the soldier. It could also refer to the human REMAINS – the image of the looter – that the soldier obsesses over so much as part of his PTSD.

What is a central idea in this poem? As is implied by the title, the poem explores the view that war is a highly traumatic experience and presents the terrible impact of trauma on survivors long after the battle has ended.

Key Vocabulary	Definition	Example
looter	a person who is stealing something, often during a war or riot.	The soldier shoots a possible _____ who appears to be robbing a bank.
agony	extreme physical or mental pain	The looter is left in _____ after being shot
traumatic	deeply disturbing or distressing	The experience of being at war was deeply _____ for the soldier.
PTSD	post-traumatic stress disorder	The speaker is experiencing _____
guilt	the act or feeling of being responsible for something bad that has happened	The soldier feels _____ as he is unsure whether the looter was really a threat.
consequence	something that happens as a result of something else	Guilt is a significant _____ of war.
solidarity	a sense of unity, or agreed feelings and actions, between people in a group	While on duty, the soldiers experienced _____ which helped them to cope with traumatic events.
isolation	being alone or feeling lonely and apart from others	Back home, the soldier feels a sense of _____ as no-one understands what he has experienced.
hopelessness	having no sense that anything will improve	The poem ends with a sense of _____: there's no sense that things will change.
psychological	related to the mind and to the emotions	Armitage illustrates the powerful _____ effects of war.

What other viewpoints are explored in the poem?

- War can cause suffering beyond the battlefield.
- War has devastating psychological consequences
- Guilt is powerful and can overwhelm us.
- War can result in us dehumanising the enemy.
- Traumatic events can have a destructive effect on those who experience them.
- Memory can have a powerful effect on us.

Year 9 Cycle 2 English: 'Remains' – Knowledge Organiser

Writer's Craft:	Example
Why is the poem written as a dramatic monologue?	To explore a traumatised soldier's thoughts and feelings; because the poem was produced following an interview with a soldier; to reinforce the soldier's isolation now he has returned home.
Why does Armitage use colloquial language?	To create a convincing voice – an ordinary person/soldier; to contribute to the almost matter-of-fact tone in the first half of the poem.
What does the first/second half focus on? What is the turning point?	First half: the shooting; second half: the emotional impact on the soldier. Turning point = 'End of story, except not really.' Reflects the fact that there is a hidden side to war that we often fail to acknowledge. Second half exposes trauma and isolation experienced by soldier.
Why is the shooting described with graphic imagery?	To convey the brutality of war; to show what has traumatised the soldier; because it's so vivid in the soldier's mind – he keeps reliving the events in graphic detail.
Why is the blood on the street described as a 'blood shadow'?	Shadow = dark imagery – connotations of death and misery; the shooting has cast a shadow over his life; a shadow follows you around – suggests the inescapable nature of trauma.
What does the imagery 'dug in behind enemy lines' suggest?	To the looter, the soldier is the enemy; the soldier's mind is enemy territory. The looter is in the soldier's mind, so this is 'behind enemy lines'. 'Dug in' means well defended and prepared for attack – this suggests that the memory of the looter is difficult to remove; 'dug in' is a military term, suggesting that the war/conflict is still going on for the soldier. Memory has now become the soldier's enemy.
What impression does the final stanza leave us with and what is meant by 'bloody hands'?	It leaves us with the impression that the pain will be ongoing – there seems little hope of an end as the looter is still 'here and now'. 'Bloody' can suggest frustration (swearing), but 'to have blood on your hands' also means to be responsible for an act of violence against someone i.e. to be guilty of something. Blood acts as a symbol of guilt.

Key Quotes: 'probably armed, possibly not' 'End of story, except not really' 'carted off in the back of a lorry' 'blood-shadow' 'his bloody life in my bloody hands'

For more revision of 'Remains', search for 'PMT Remains Revision'.

How does each image link to the ideas in the poem?

Year 9 Cycle 2 English: 'London' – Knowledge Organiser

What happens in the poem? It's the late 1700s. The speaker (Blake we might imagine) walks around the poor streets of London by the Thames river and comments on what he sees. What he sees is misery: in every face he looks at. He thinks about those who are especially powerless in this miserable city and how the powerful in society are responsible for their suffering: children work in dangerous conditions but the powerful church does nothing about this; kings and governments send soldiers off to die in their wars. In all the sounds of suffering that he hears he sees that people are metaphorically imprisoned, mental slaves. Although they are not physically trapped, they are trapped in their misery and slaves to the city or the powerful people within it.

What is the context of the poem?

- The poem was written in the 1790s.
- London was (and is) the capital city of the United Kingdom.
- As a capital city, it is where the power is: it's where the king lives, it's where the government meets.
- London was at the centre of the rapidly-growing British Empire and was a place where extreme wealth could be found (as today).
- However, it was a place of extremes: it was also a place of extreme poverty (as today).

What is the significance of the title? The poem describes Blake's view of London poverty; however the word London has connotations of power because it is the capital and so hints at the idea of powerlessness.

Key Vocabulary	Definition	Example
woe	extreme, prolonged sadness and misery.	The citizens of London suffer constant _____.
inequality	the unfairness or difference in opportunities and wealth between different groups in society.	The root of the problems in Blake's 'London' is social _____.
liberty	freedom to live as you choose.	The citizens in 'London' lack _____.
restriction	a rule, law or belief that limits what you are able to do.	The people of London are subject to many _____.
power	the ability to control people or things.	Blake mentions organisations that hold _____ such as the church and the monarchy.
conflict	strong disagreement between different people, groups, ideas or emotions.	There is _____ between the needs of the rich and the poor.
dominance	the state of having more power, importance or significance than other things or people	People in power exert _____ over the poor in society.
vulnerability	the state of being weak and easily hurt, emotionally or physically.	_____ in society is highlighted through the references to children within the poem.
hypocrisy	when someone acts in a way that doesn't match up to their expectations of others.	The church is a symbol of hypocrisy: it tells others to help the poor but keeps its own wealth for itself.
oppression	prolonged cruel or unjust treatment or exercise of power over people.	The poor in London' have been subject to _____, leading to their feelings of weakness.

What are the central viewpoints in this poem?

- London is a miserable and nightmarish place for the poor.
- People are trapped in lives of misery because they are powerless (or feel powerless) to make changes to their lives.
- The powerful don't care about the suffering of ordinary people: the poor are oppressed for the benefit of the rich.
- Childhood is destroyed by city life: innocence is corrupted.

Year 9 Cycle 2 English: 'London' – Knowledge Organiser

Writer's Craft:	Explanation
Why does the title 'London' connote power and control?	London is the capital city: it is where the king is based and where government meets. It is where all the important decisions that affect ordinary people's lives are made.
How does the use of the word 'chartered' suggest a lack of freedom?	It means that there are rules and restrictions about how places can be used: the streets and the river are effectively owned. Describing the Thames in this was is interesting as we would normally associate nature with freedom.
What is Blake trying to emphasise through repetition of the word 'every'?	He's trying to make it clear that suffering is omnipresent (everywhere) in this part of London: it's not just one or two people in this miserable state. It suggests that it's a problem with society rather than individual people.
What is Blake trying to emphasise through repetition of the word 'cry'?	Cry can mean 'shout' but it can also mean to call out in pain. Repeating it suggests that pain is also omnipresent (everywhere) in this part of London.
What is Blake suggesting through the image of the mind-forged manacles?	He's suggesting that the people he sees are trapped in their misery through invisible slavery (the manacles (handcuffs) are in the mind rather than physically imprisoning them. It could be that they are 'slaves' because they are ordinary poor people without the power to change the system; it could be that they have been trained to think that this misery is a normal part of life and so can't even imagine trying to change anything.
What do the words 'cry', 'tear' and 'woe' have in common? What is Blake suggesting?	They are part of the semantic field of suffering (i.e. they are all words to do with suffering). Blake is making us constantly aware of how much suffering there is in London.
How does the structure of the poem represent restriction?	Blake's structure is highly regulated, with a strong, constant rhythm and regular rhyme scheme. This could reflect the repetitive restrictions faced by the poor of London: they are unable to break free from the cycle of suffering.
How does the end of the poem suggest that the misery will continue?	There is no hope mentioned. The next generation seem already 'infected' and cursed to suffer.

Key Quotes: 'mind-forged manacles' 'chartered Thames' 'chimney-sweeper's cry' 'marks of weakness, marks of woe' 'black'ning church appals'

For more revision of this poem, search for 'William Blake London Lit Charts'.

How does each image link to the ideas in the poem?

English: Power and Conflict Poetry - 'Ozymandias' – Knowledge Organiser

What happens in the poem? The poem is built around the idea of the persona ('I') meeting a traveller from an old and distant land. The main focus of the poem is what that traveller describes: a broken statue of the Egyptian ruler Ozymandias (Ramases II) standing in a desert. The statue is huge: the legs are 'vast'. But it's only the legs that are left standing: there's no sign of the main body (the trunk). The head is lying in the sand 'half sunk' and is 'shattered'. The legs stand on a pedestal with an inscription boasting about Ozymandias' power. However, the statue is broken and there is nothing left of Ozymandias' empire: the statue is surrounded by desert that stretches into the distance. Ozymandias' boast – which must once have meant something – is now empty as both he and his empire are dead.

What is the context of the poem?

- Ozymandias was a pharaoh (king) of ancient Egypt.
- He is more widely known as Rameses II (he was referred to as Ozymandias in ancient Greece).
- He ruled for 67 years from 1279 BC to 1213 BC (that's over 3000 years ago!).
- Both he, and Egypt, were incredibly powerful.
- He ordered the building of many great works in his lifetime.
- Shelley was a Romantic poet. Romantic ideas included a belief in the power of nature over humans. Romantics also believed in the power of art.

Key Vocabulary	Definition	Example
Ephemerality	The state of lasting for only a short time.	_____ applies to everything; nothing lasts forever.
Permanence	The state of lasting unchanged for a very long time/forever.	There seems to be a _____ to conflict; it never seems to end.
Mortality	The state of not living forever	Humans die; _____ is just a part of being human.
Immortality	The state of living forever, not dying	No one lives forever; _____ doesn't exist in real life.
Insignificance	The condition of being too small or unimportant for people to care about.	When thinking about how many millions of years the dinosaurs walked the earth, it's easy to see the _____ of humans.
Despair	To give up hope	It's easy to feel miserable and _____ in the winter, but it's important not to give up hope.
Decay	To become gradually damaged, worse, less	Everything will _____ if you leave it for long enough. Even the great pyramids are starting to crumble.
Colossal	Extremely large	It wasn't a small mess that she had made in her bedroom; it was _____.
Boundless	Without limit, without end	He was such a positive person. He had _____ enthusiasm.

What is the significance of the title? The poem – like the statue – is all about Ozymandias. By using the lesser-known Greek name, many when reading this poem will think 'who?' This emphasises just how much Ozymandias' power and influence have changed since his lifetime.

What are the central ideas in this poem?

- Power is ephemeral (not permanent)
- Human power in particular is ephemeral
- Nature/time is more powerful than humans
- Even the most powerful humans are mortal

English: Power and Conflict Poetry - 'Ozymandias' – Knowledge Organiser

Writer's Craft:	Explanation
How can a statue symbolise someone's power?	To have a statue of yourself built, you need to have power and wealth in the first place. The statue itself is a display of this power.
How do the adjectives 'vast' and 'colossal' emphasise the scale of this power?	The bigger the statue, the more power and wealth needed to construct it. A vast statue is, therefore, a symbol of vast power.
In 'Look on my works ye Mighty and despair!', how does the word 'Look' suggest Ozymandias' power? What tone is suggested by the exclamation mark?	Look is a command (an imperative verb) and makes it sound as if Ozymandias is so powerful that he has the power to command other powerful people ('ye Mighty). 'Despair' is also a command – it's as if he is ordering other powerful people to give up hope because they will never be as powerful as him. The exclamation mark suggests that this order is being spoken loudly and confidently – just as we might imagine a powerful and confident ruler to speak.
How does Ozymandias' boast contrast with the following line: 'Nothing beside remains'?	The boast contrasts with the next line because there are no 'works' to look on. The statue itself is broken and although it might once have been surrounded by a great civilisation, now there is just desert. Ozymandias' words are undermined by reality.
How does Shelley use the statue to symbolise Ozymandias' loss of power?	The statue once symbolised Ozymandias' power. The fact that it is now broken and decaying symbolises that Ozymandias' power has also decayed – he no longer has the wealth or power to look after it (because he's long dead).
Why does Shelley use the word 'shattered' rather than broken to describe the visage of the statue?	Shattered suggests that something is broken into many pieces, almost completely destroyed. It's making the point that Ozymandias' power has been completely destroyed too.
Why does Shelley describe the statue as a 'wreck' rather than as just broken?	'Wreck' makes it sound destroyed – just like Ozymandias' power.
Why do you think the poem ends by focusing on the desert: 'the lone and level sands stretch far away'?	The sands symbolise nature – or perhaps the sands of time. Ozymandias' civilisation has disappeared beneath the desert. Shelley therefore leaves us with the image of emptiness and a focus on the true power in this poem: nature/time.

Key Quotes: 'Two vast and trunkless legs of stone / Stand in the desert.' 'shattered visage' 'Look on my works, ye Mighty, and despair!' 'Nothing beside remains.''

For more revision of this poem, search for 'Ozymandias Lit Charts'.

How does each image link to the ideas in the poem?

Year 9 English Cycle 2: Reading and Writing Viewpoint Texts

Key Concepts for Cycle 2:

Image	Key Word	Definition:	Example sentence:
	viewpoint	A person's opinion or point of view; what a person thinks or feels about a particular subject or experience.	He expressed a strong **viewpoint** about the plans to build a new skate park in his town.
	perspective	The background factors or experiences that shape an individual's viewpoint.	She speaks from the **perspective** of someone who has had a negative experience of this issue herself.
	reasoning	The process by which you reach a conclusion after thinking about all the available facts or evidence.	Can you explain the **reasoning** behind your decision?
	universal	Relating to everyone or everything.	The NHS provides **universal** access to healthcare.
	comparison (n) compare (v)	Identification of similarities and differences between two or more things.	In **comparison**, his second piece of writing was far mor detailed than his first piece.
	connotation (n). connote (v)	A feeling or idea that a person associates with a word. It is different from its denotation (dictionary definition).	The colour green can have **connotations** of safety or nature, depending on context.

Year 9 English Cycle 2: Reading and Writing Viewpoint Texts

Revision: Language terminology

Method	Definition	General Effect:	Example
imagery	A general term for descriptive language that helps the reader to *imagine* something that is being written about.	Enables the reader to create a mental picture of a situation, particularly an unfamiliar one or one created by the writer in fiction.	The snowflake danced to the ground as the view turned a pearly white before his eyes.
metaphor	A form of imagery where one thing is described as *being* something else.	Allows the reader to create a vivid mental picture; can convey emotions through implication.	**The lake was glass** in the moonlight.
simile	A form of imagery where one thing is described as being similar to something else, using the words 'like' or 'as'	Allows the reader to create a vivid mental picture, often by comparing something new with something more familiar.	She crept towards the doorway – **as quiet as a mouse.**
personification	A form of imagery where a non-living object is described using human actions, features or emotions.	Allows the writer to assign emotions to the object; often helps to develop atmosphere.	**The sofa hugged the weary traveller** – comforting him after his terrible journey.
symbol	An object used to represent an idea or concept.	Helps to present abstract ideas in a more sophisticated way.	A wedding ring symbolises eternal love.
motif	An image or symbol that is repeated throughout a story.	Shows how an idea changes or develops	The lift was a motif in 'Long Way Down'.
colour imagery	Use of colours to form part of the description.	Can allow the writer to use connotations of the colours to develop meanings.	The **green blue** translucent sea.
adjective	Words that describe what a person, place, thing or emotion is like.	Enables the reader to develop a vivid mental picture. Look for connotations.	The **iridescent** lake glistened in the **wintery**, but yet **warming**, sunlight.
verb	Words that name actions or states of being. Every sententence must contain at least one.	Think about the connotations of the verbs used.	Lenny **slashed** at Curley with his fists.
adverbial	A word or phrase that gives information about the verb.	Tell us how, when, where or how often the verb happens.	**Sadly**, he was **always** too late to enter.
first person	Story told from the viewpoint of a character within it.	Gives us access to the character's inner thoughts as we follow their experiences.	**I** walked towards him, **my** hands trembling.
third person	Story told from the viewpoint of someone who is watching it happen.	Allows us to observe the action while giving us access to the wider perspective or views of multiple characters.	**She** walked towards him, **her** hands trembling.

Vocabulary for writing about viewpoints in texts

Anger	•Disgust: contempt, disgust, revulsion •Envy: envy, jealousy •Exasperation: exasperation, frustration •Irritation: aggravation, agitation, annoyance, grouchiness, grumpiness, irritation •Rage: anger, bitterness, dislike, ferocity, fury, hate, hostility, loathing, outrage, rage, resentment, scorn, spite, vengefulness, wrath •Torment: torment
Fear	•Horror: alarm, fear, fright, horror, hysteria, mortification, panic, shock, terror •Nervousness: anxiety, apprehension, distress, dread, nervousness, tension, uneasiness, worry
Joy	•Cheerfulness: amusement, bliss, cheerfulness, delight, ecstasy, elation, enjoyment, euphoria, exhilaration, gladness, glee, happiness, jolliness, joviality, joy, jubilation, satisfaction, triumph •Contentment: contentment, pleasure •Enthrallment: enthrallment, rapture •Optimism: eagerness, hope, optimism •Pride: pride, triumph •Relief: relief •Zest: enthusiasm, excitement, exhilaration, thrill, zeal, zest
Love	•Affection: adoration, affection, attraction, caring, compassion, fondness, liking, love, sentimentality, tenderness •Longing: longing •Lust: arousal, desire, infatuation, lust, passion

Sadness	•Disappointment: disappointment, dismay, displeasure •Neglect: alienation, defeat, dejection, embarrassment, homesickness, humiliation, insecurity, isolation, insult, loneliness, neglect, rejection •Sadness: depression, despair, emptiness, gloom, glumness, grief, hopelessness, melancholy, misery, sadness, sorrow, unhappiness, woe •Shame: guilt, regret, remorse, shame •Suffering: agony, anguish, hurt, suffering •Sympathy: pity, sympathy
Surprise	•Surprise: amazement, astonishment, surprise
Other	•nostalgia, uncertainty, acceptance, pride, calm, confusion, internal conflict

Words to write about power	Words to write about powerlessness
dominant / dominance controlling forceful overwhelming oppression / oppressive omnipotence punishment threatening strength authority awe-inspiring significant	weak oppressed overwhelmed inability / unable insignificant controlled pleading helpless incapable vulnerability imprisonment

Year 9 English Cycle 2: Reading and Writing Viewpoint Texts

Sentence Structures: Embedding Quotations

Where?	Who?	About What?	Which Quotation?
At the start,	the writer	describes…	using the word '_'
Near the middle,	the poet	narrates…	using the phrase '_____'
Towards the end,	Armitage	explains…	through the image of '____'
Immediately after,		states…	through the repetition of '_____'
Later on,		develops…	through the pronoun choice of '_____'
Throughout the poem,		shows…	

Sentence Structures: Structuring Analytical Comments

Method?	Idea being presented?	How is the idea conveyed?
This use of [method]	suggests that…	because…
The use of the word '_____'	presents the idea that…	as…
The image of '_____'	describes the situation as…	by…
	creates a sense of…	
	develops a tone of…	

Useful connectives for linking ideas

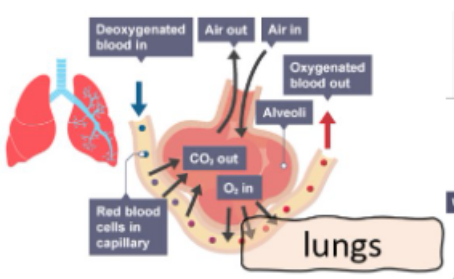
in addition…
moreover…
furthermore…
additionally…
alternatively…

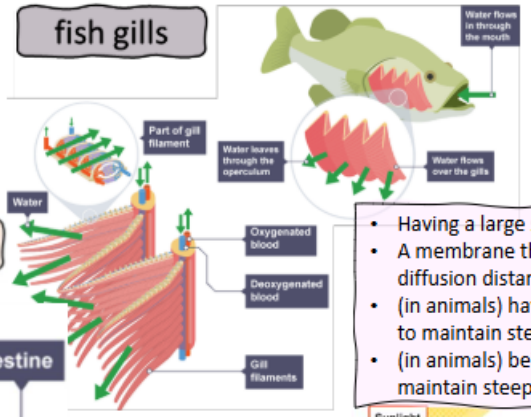
Useful phrases for comparison

however…
in contrast…
similarly…

Biology: Year 9 Cycle 2 Knowledge Organiser – Cell Division and Defence

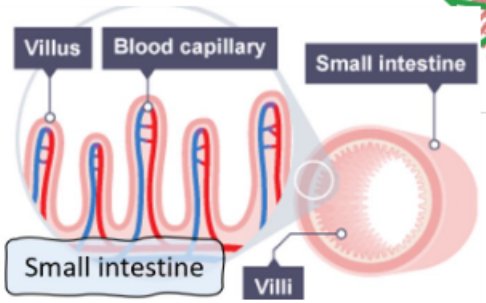
Lesson 1: Specialised gas exchange surfaces

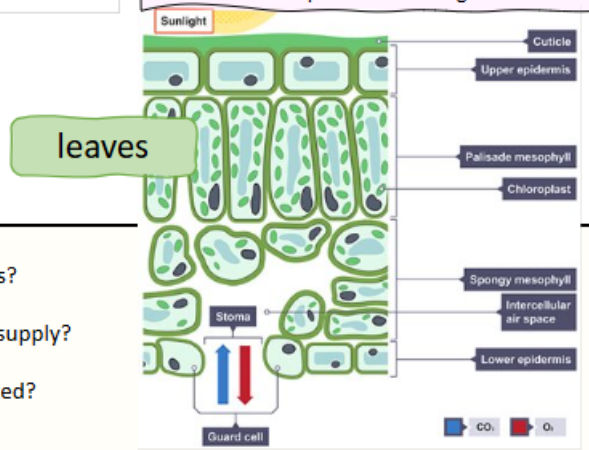




In multicellular organisms, surfaces and organ systems are specialised to exchanging materials. The effectiveness is improved by...

- Having a large surface area
- A membrane that is thin, to provide a short diffusion distance
- (in animals) having an efficient blood supply to maintain steep concentration gradients
- (in animals) being well ventilated to maintain steep concentration gradients.



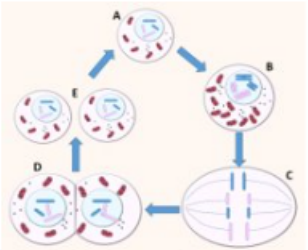


Questions:

1. What can you say about the surface area of exchange surfaces?
2. Why must exchange surfaces be thin?
3. In animals why do exchange surfaces need an efficient blood supply?
4. Why do leaves need air spaces?
5. In animals, why do exchange surfaces need to be well ventilated?

Lesson 2: Mitosis and the cell cycle

The cell cycle has three overall stages:



Important:
- Growth
- Replacing cells
- Repairing tissues
- Asexual Reproduction

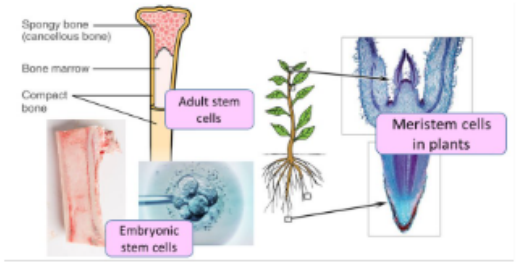
Cells divide in a series of stages called the **cell cycle** during which genetic material is double and then the cells divide into two genetically identical cells.

Stage	Events
Stage 1	• Increase number of sub-cellular structures like mitochondria and ribosomes. • DNA replicates and forms two copies of each chromosome.
Stage 2 (mitosis)	• One set of chromosomes are pulled to each end of the cell and the nucleus divides.
Stage 3	• The cytoplasm and cell membranes divide to form two identical cells.

Questions:

1. What is the cell cycle?
2. What happens in stage 1 of the cell cycle?
3. What happens in stage 2 of the cell cycle?
4. What happens in stage 3 of the cell cycle?
5. Why is mitosis important to multicellular organisms?

Lesson 3: Stem cells

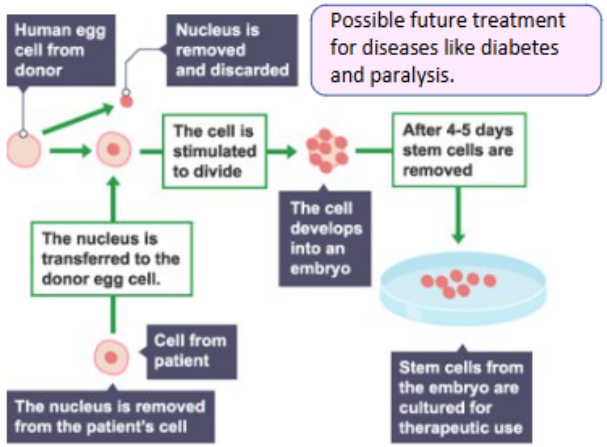


- **Embryonic Stem Cells** from human embryos can be made to differentiate into most types of human cells. There are **ethical** issues with their use.
- **Adult Stem Cell** e.g. from bond marrow can differentiated into related cell types only, for example bone marrow stem cells can differentiate into blood cells and cells of the immune system but not other cell types.
- **Meristem tissue** in plants can differentiate into any type of plant cell throughout the life of a plant.
  - Rare species of plants can be cloned to protect them from extinction.
  - Crop plants with special features like disease resistance can be cloned.

Questions:

1. Which type of stem cells can differentiate into most other different types of cells?
2. Which type of stem cells can only differentiated into the cells related to the tissue that they came from?
3. What is the **ethical** issue with using embryonic stem cells?
4. What can meristem tissue cells differentiate into?
5. What can meristem cells be used for?

Lesson 4: Therapeutic cloning



- In therapeutic cloning an embryo can be produced from the patients own cells. These cells are not rejected by the patients' immune system so they may be used for medical treatment.
- There are risks such as transfer of viral infection and some people may have ethical or religious objections, but the patient can give their consent, and embryos are not destroyed.

Questions:

1. What is therapeutic cloning?
2. Which diseases might be treated with therapeutic cloning?
3. Why aren't the cells used in therapeutic cloning rejected by the patients own body?
4. What are the risks of therapeutic cloning?
5. Why do cells used in therapeutic cloning said to have fewer ethical concerns than using embryonic stem cells?

Lesson 5: Intro to communicable diseases

Pathogen – a microbe that causes a disease.

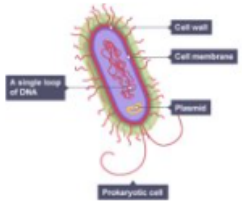
Name	Type of microbe	Spread by
measles	virus	Inhaling droplets from sneezing and coughing
HIV	virus	Sexual contact or exchange of body fluids like blood when drug users share needles.
TMV	virus	Direct contact plant to plant and contaminated tools and gardeners hands.
Salmonella	bacteria	Ingested with food prepared in unhygienic conditions or not cooked properly
Gonorrhoea	bacteria	Sexual contact
Rose black spot	fungus	Spread via fungal spores through water or wind and on contaminated tools and gardeners hands.
Malaria	protist	Mosquito vectors biting humans and passing on the pathogen.

Questions:

1. What is the definition of a pathogen.
2. Which communicable diseases are caused by viral pathogens?
3. Which communicable diseases are caused by bacterial pathogens?
4. How is measles spread from one person to another?
5. Which communicable disease is caused by a protist organism?

L6: Bacterial Diseases

Salmonella and **Gonorrhoea** are both caused by bacterial pathogens.



Disease	Symptoms	Control of spread	Cure
Salmonella	• Fever • Abdominal cramps • Vomiting • diarrhoea	• UK poultry are vaccinated against Salmonella • Prepare food in hygienic conditions • Cook food properly	• Rehydrate with electrolytes • Antibiotics generally not used.
Gonorrhoea	• Pain on urinating • Thick yellow discharge from penis or vagina	• Use a barrier method of contraception e.g. condom	• Antibiotic - penicillin

- **Bacteria** make us feel sick because they release **toxins** which can damage our cells.
- **Antibiotics** are drugs that kill bacteria – although many are becoming resistant to them.

Questions:

1. What are the symptoms of *Salmonella*?
2. How is the spread of *Salmonella* controlled?
3. What are the symptoms of Gonorrhoea?
4. How can the spread of Gonorrhoea be controlled?
5. Which drugs can be used to treat Gonorrhoea because they kill bacteria?

L7:Viral and fungal diseases

Antibiotics cannot kill viruses or fungi.

Disease	Symptoms	Spread by	Control of spread
Measles (virus)	• Fever • Red skin rash • Can be fatal (death)	• Droplet infection • Coughs • Sneezing	Vaccination
HIV/AIDS (virus)	• Flu-like to start with • Damages immune system AIDS develops into • Other infections • Cancers	• Unprotected sex • Exchange of body fluids e.g. blood • Sharing needles (drug uses)	• Condoms • Practice safe sex • Don't share needles • Use antiretrovirals
TMV (virus)	• Mosaic pattern on leaves. • Discolouration • Stunted growth due to reduced photosynthesis	• Direct contact with other plants. • On the tools and hands of gardener.	• Remove damaged part of plant and destroy (burn) it. • Clean tools and wash hands.
Rose Black Spot (fungus)	• Purple black spots on leaves. • Leaves turn yellow and drop off early.	• Spores of fungus in wind and water. • On the tools and hands of gardener.	• Remove damaged part of plant and destroy (burn) it. • Clean tools and wash hands. • Use of fungicides

Questions:

1. Why are most young children vaccinated against measles?
2. What are the symptoms of measles?
3. Which body system is damaged by HIV?
4. Which drugs are used to control HIV to help prevent it becoming AIDS?
5. Why do TMV and Rose black spot both reduced the rate of photosynthesis?

Lesson 8:Protist disease

The malarial lifecycle includes the mosquito. Malaria causes recurrent episodes of **fever** and can be **fatal**. The spread of malaria is controlled by:

- Sleep under net

- Use insect repellent

- Drain stagnant water so mosquitos have nowhere to lay eggs

- Spray waterways with insecticide.

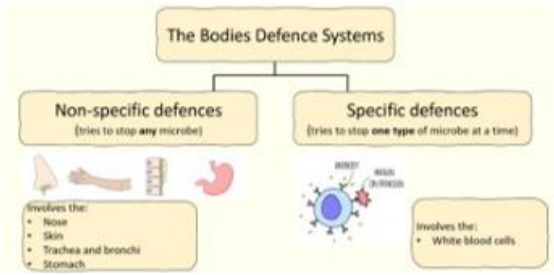
Pathogen – protist
Vector – mosquito
Host – mosquito

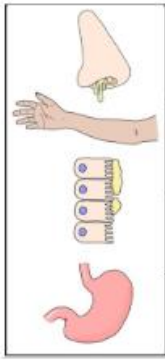
The **mosquito** bites an **infected person** for a **blood meal** then flies of and **bites another** person and **infects them**.

Questions:

1. What are the symptoms of malaria?
2. What precautions can be taken to stop being bitten by mosquitoes?
3. What precautions can be taken to prevent mosquitos laying eggs in water?
4. What is the difference between the **pathogen** and the **vector**?
5. How does someone become infected with malaria?

Lesson 9: Non-Specific Defences





Nose: - Contains hairs to help prevent entry of objects including dust and microbes.
Mucus: Traps dust and microbes before they get into the lungs.

Skin: - Acts like a **physical barrier**.
Secretes **antimicrobials** that kill microbes.
If **cut**, blood **clots** and forms scabs to prevent entry of microbes and to stop bleeding out.

Ciliated Epithelium: - Goblet cells secrete mucus to trap pathogens, cilia to waft mucus up to the throat where it is swallowed. Pathogens killed with stomach acid.

Stomach: -Contains hydrochloric acid pH 2 (strong acid) which kills pathogens by denaturing their enzymes.

Questions:

1. What is the difference between non-specific and specific body defences?
2. How does the nose help to prevent entry of pathogens?
3. How does the skin help to prevent entry of pathogens?
4. How does the ciliated epithelium help to prevent entry of pathogens?
5. How does the stomach prevent entry of pathogens?

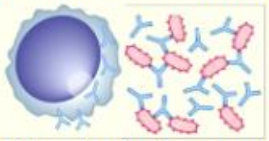
Lesson 10: Types of White Blood Cells

White blood cells help to defend against pathogens

Phagocytosis – engulf and digest microbes.

Some white cells ingest and destroy pathogens so they can't make you ill.

White blood cells – antibody production



Antibodies target particular bacteria or viruses and destroy them. They are unique to the pathogen.

White Blood cells – antitoxin production

Bacteria release toxins that can damage cells.

Some white cells produce antitoxins. These counteract (cancel out) the toxins released by pathogens.

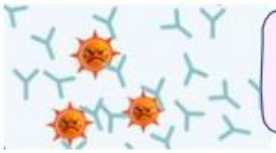
Questions:

1. What is phagocytosis?
2. Antibodies are proteins, how do they help defend against pathogens?
3. Which pathogens release toxins?
4. What do toxins do to our body cells?
5. What do white blood cells make to cancel out toxins?

Lesson 11: Vaccinations

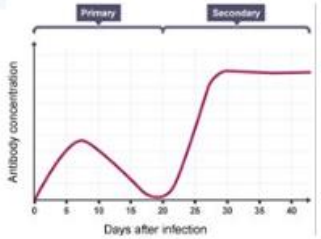
Small quantities of dead or inactive forms of the pathogen are introduced into the body.

The inactive form of the pathogen stimulates the white blood cells to produce unique antibodies.



If the same pathogen re-enters the body the white blood cells respond quickly.

The **secondary** responds is steeper and bigger, more antibodies are made more quickly



Questions:

1. What is injected when you are vaccinated?
2. What the white blood cells make in response to the weakened pathogen?
3. What happens if the 'real' same pathogens enters the body?
4. How is the secondary response different from the primary response?

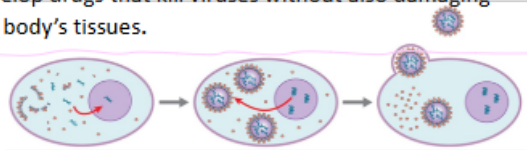
Lesson 12: Antibiotics and Painkillers

Antibiotics – are drugs that kill **bacteria.** They don't kill protists, fungi or viruses

- The use of antibiotics has greatly reduced deaths from infections bacterial diseases.
- However, the emergence of strains of resistant to antibiotics is a great concern.

Penicillin was first discovered by Alexander Fleming in 1928.

- Viruses reproduce inside cells, so it is **difficult** to develop drugs that kill viruses without also damaging the body's tissues.



Painkillers – are used to treat the **symptoms** but they are not a cure, they don't kill the pathogen.

Questions:

1. Which pathogens do **antibiotics** kill?
2. Why is it difficult to develop drugs that destroy viruses?
3. How are **painkillers** different to **antibiotics?**
4. How have **antibiotics** helped humans?
5. What is the worry about the future of antibiotics?

Lesson 13: Antibiotic Resistance


Bugs resistant to antibiotics 'will kill more than cancer'

Problems with antibiotics – commonly prescribed antibiotics are becoming less effective due to a number of reasons:

- Overuse of antibiotics
- Failing to complete the fully prescribed course
- Use of antibiotics in farming.

Antibiotic resistance is increasing, these bacteria are known as superbugs.

Ways to reduce antibiotic resistance

- Only take antibiotics when necessary.
- Treat specific bacteria with specific antibiotics.
- High hospital hygiene levels, including regular hand washing by staff and visitors.
- Patients who are infected with antibiotic resistant strains of bacteria should be isolated from other patients.

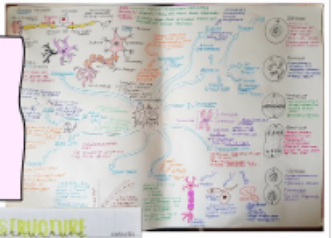
Questions:

1. What does it mean when we say bacteria are resistant to antibiotics?
2. Why might antibiotic resistance lead to future health problems?
3. What are the reasons for the increase in antibiotic resistance?
4. What can be done to reduce the increase in antibiotic resistance?

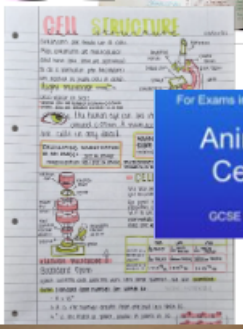
Revision

Mind-maps

The process of making revision materials makes you more likely to remember the facts and make links across the ideas



Own notes



Videos

Personalise your revision different things work for different people.

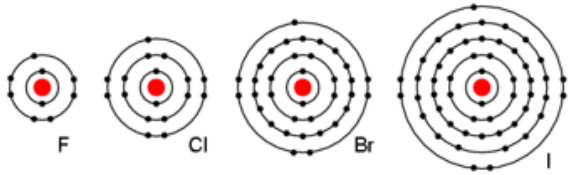
Flashcards

How to revise

1. Make some revision materials using reliable sources like Bitesize Science AQA Trilogy or the CGP Revision Guide.
2. Use the revision materials, look back at them, get people to quiz you on them.
3. Revise the things you don't know first.
4. Sort your pile of revision cards into things you know and things you don't and concentrate on the hard things.

Lesson 1 – Group 7

Atomic radius (size) Increases as you go down group 7.

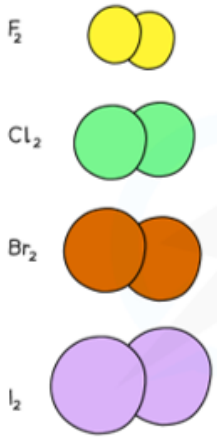


Reactivity decreases down the group:

- So have **7 electrons** in their **outer shell**
- All atoms need to **gain 1 electron** to fill their outer shells
- **Atomic radius get bigger as** you go down the group
- Nucleus is further away from the outer shell
- Therefore, the bigger the atom the **harder** it is for an atom to **gain an electron.**

Boiling point increases down the group:

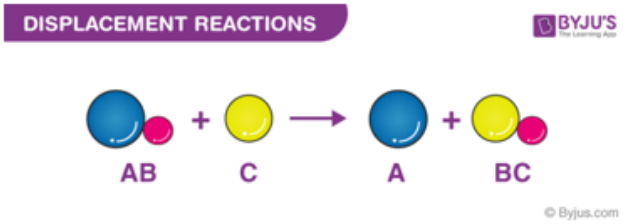
- Halogens are non-metals and are **diatomic molecules** at room temperature
- This means that they exist as molecules which are made up of two of the same type of atom, such as F_2
- The halogens are **simple molecular structures** with **weak** intermolecular forces.
  As you go down these forces get stronger.



Lesson 2 – Group 7 displacement

Reactivity decreases down group 7, so the most reactive element is Fluorine, the least reactive is Astatine.

A displacement reaction is where a more reactive element 'swaps' with a less reactive element. The more reactive element will end up in a compound, bonded to another element.



For example:

Fluorine is more reactive than Chlorine, so will displace Chlorine in Sodium Chloride:

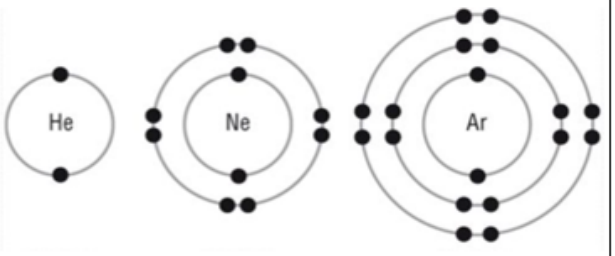
Fluorine + Sodium Chloride → Sodium Fluoride + Chlorine
F_2 + NaCl → NaF + Cl_2

Bromine is less reactive than Chlorine, so it cannot displace Chlorine:

Bromine + Sodium Chloride → No reaction
Br_2 + NaCl → No reaction

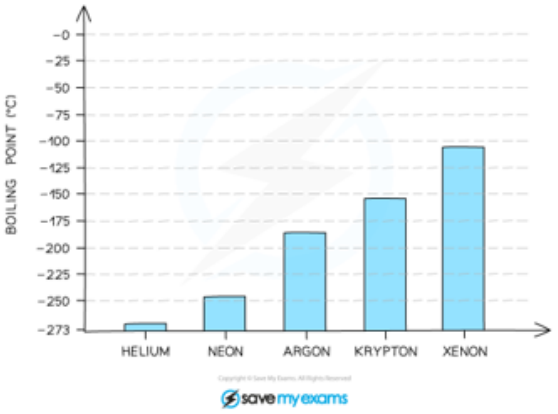
Lesson 3- Group 0

Group 0 are Inert (unreactive)
They do not lose or gain electrons, because they have a **full outer shell.**

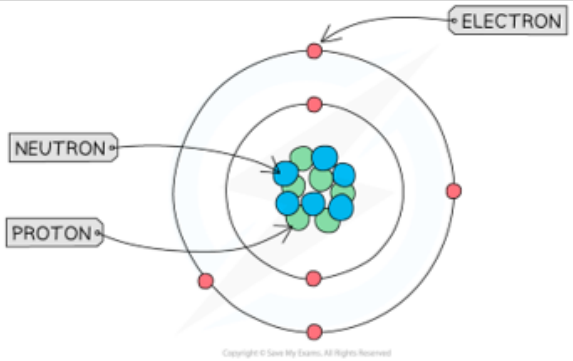


Boiling points increase as you go down group 0:

- Size increases
- Intermolecular forces get stronger
- More energy is required to break these forces of attraction.

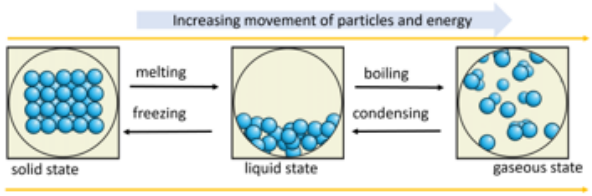


Lesson 4 – Atom review



Subatomic particle	Relative mass	Relative charge
Proton	1	+1
Neutron	1	0
Electron	1/2000	-1

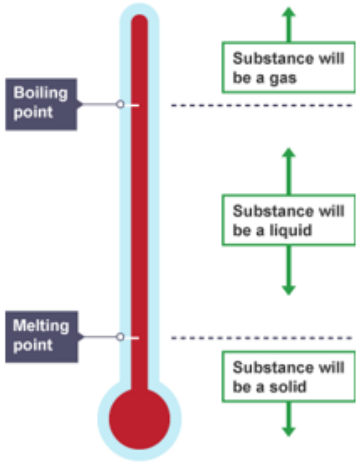
Lesson 5 – States of matter



Solids, liquids and gases can change state.
Gases have the most energy, and more movement of particles.

A boiling point is the temperature at which a liquid will change state to a gas, **or** a gas will condense to a liquid.

The melting point is the temperature at which a liquid will freeze, **or** a solid will melt.

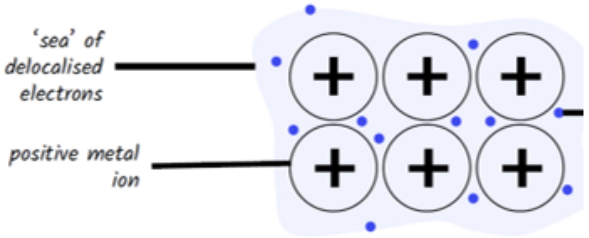


State symbols are used to represent states:
s – Solid
l- Liquid
g- Gas
aq- Aqueous (dissolved in water)

Lesson 6- Metallic bonding

Metallic bonding happens in Metals.

- Metals become **positive ions** (by losing an electron).
- The electrons become **delocalised** (free to move)
- There is a strong **force of attraction** between the metal ions and **delocalised** electrons in a giant metallic structure (high melting points).



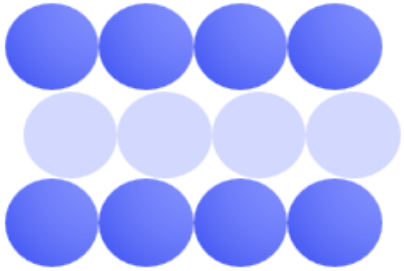
Metals are good thermal and electrical **conductors**. Each metal atom donates its outer electrons to the metal structure, making them free to move (**delocalised**), which can carry heat or electrical charge through the material.

Metals are **malleable**. This means that they can be hammered into shape.
Metals are **ductile**. This means that they can be drawn or pulled into a wire.

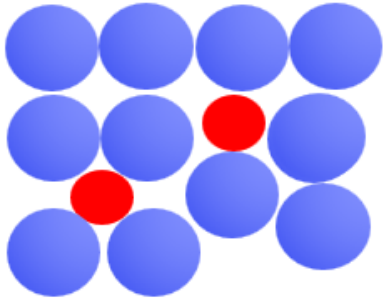
When force is applied to a metal, the layers of ions slide over each other, resulting in a change of its shape without it breaking.

Lesson 7 - Alloys

In a pure metal, the metal ions are arranged in a regular lattice structure:



An **alloy** is a mixture of different elements, where at least one element is a metal, and the regular lattice structure is distorted:



Alloys are often **less ductile and malleable** than pure metals.

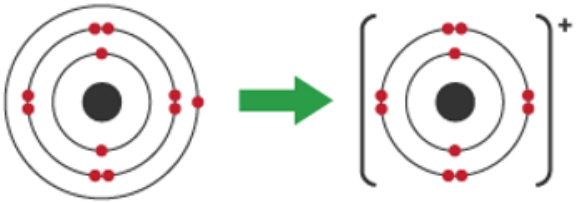
The different sized metal ions make it **harder** for the **layers** of metal to **slide** past each other.

e.g. Pure iron is a relatively soft metal that rusts easily.
Steel is an **alloy** of iron and carbon; it is harder than pure iron and less likely to rust.

Lesson 8- Ionic bonding

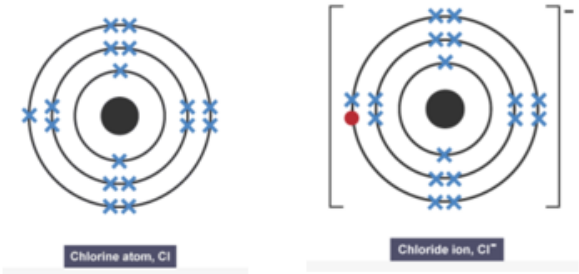
When **metals and non-metals** bond.

Metals become positive ions- by giving away electrons.



Sodium atom	Sodium ion
Na 2.8.1	Na^+ 2.8

Non-metals become negative ions- by gaining electrons.



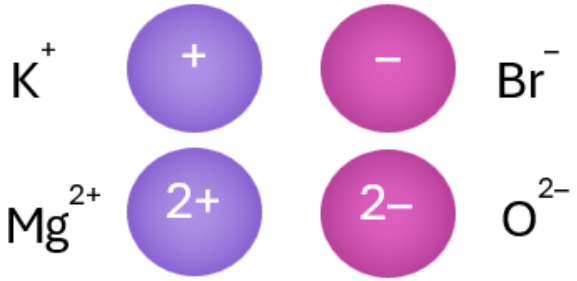
This gives both the metal and non-metal **full outer shells of electrons**.

The oppositely charged ions are attracted, which is an ionic bond.

Lesson 9- Ionic formula

The **charge of the ion** is dependent on the number of electrons in the outer shell (group number).
Group 1 **metals lose** 1 electron, but group 2 metals lose 2 electrons. (to get a full outer shell)

Group 7 **non-metals gain** 1 electron, but group 6 gain 2 electrons (to get a full outer shell)

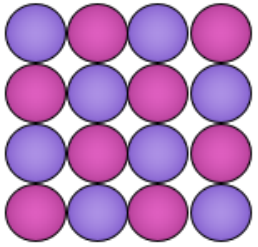


When they make ionic compounds, the **charges need to balance.**

For example:
1 Potassium can bond with 1 Bromide (KBr).
1 Magnesium can bond with 1 Oxide (MgO)

Whereas-
2 Potassium ions are required for 1 Oxide ion (K_2O)
1 Magnesium and 2 Bromide Ions ($MgBr_2$)

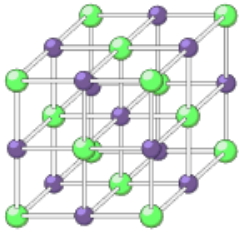
In an ionic salt, they form a **lattice:**
A giant, repeating structure of alternating positive and negative ions.



Lesson 10- Ionic properties

Ionic Compounds have **high melting points:**

- **Ionic bonds are strong.**
- The **lattice structure** of ionic compounds means there are lots of ionic bonds to break.
- This means **lots of energy** is needed to break the bonds, resulting in higher melting and boiling points.



Ionic Compounds **conduct electricity, only** when molten or dissolved:

Solid State:

The ions are *fixed* in place within the lattice structure and *cannot move freely. Cannot conduct.*

Molten State or Solution:

The *ions are free to move.*

This movement of ions allows the compound to *conduct electricity.*

Key terms:

Metal ions- Positive

Non-metal ions- Negative

Ionic lattice- Repeating pattern of opposite charges

Electrostatic force- Charges attracting or repelling

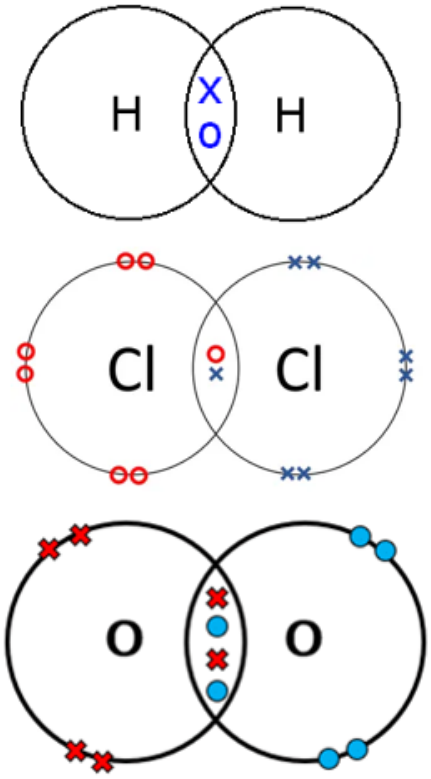
Melting point- the temperature at which a solid melts.

Lesson 11- Covalent bonding

When **non-metals bond.**

They **share pairs of electrons to get a full outer shell.**

e.g. H_2, Cl_2, O_2



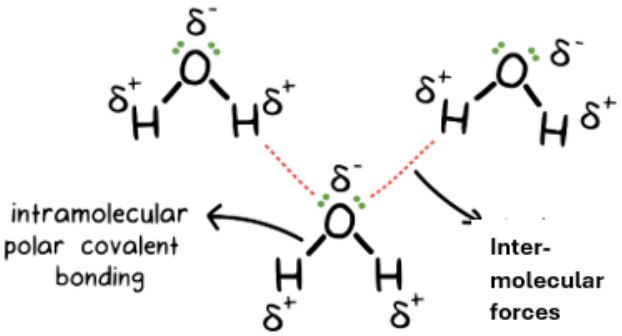
Lesson 12- Covalent properties

When changing state- the **covalent bonds remain unchanged.**

We change the intermolecular forces.

The covalent bonds are strong.

The intermolecular forces are weak.



Typically, small covalent molecules are usually **gases or liquids at room temperature** with relatively **low melting and boiling points.**

Covalent compounds have weak intermolecular forces (forces between molecules).

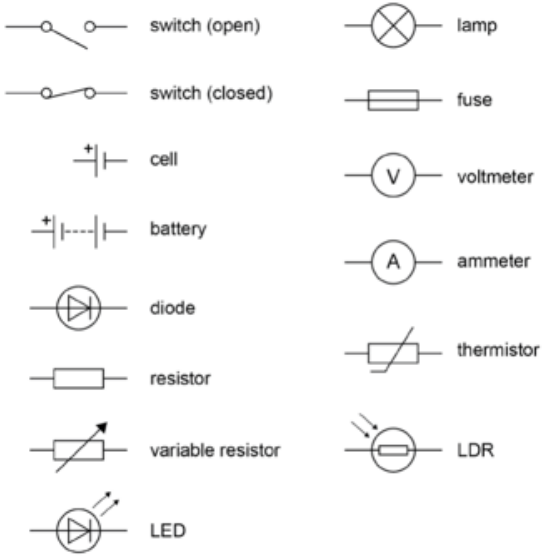
These forces require **small amounts of energy** to break.

Simple covalent molecules **do not conduct electricity,** because there are **no free moving charges (ions or delocalised electrons).**

Lesson 1 – Circuits and Symbols

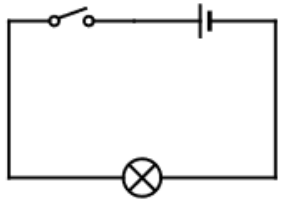
"Electricity" is a flow of **charged particles** called a **current**. For a current to flow, a circuit must be **complete**.

Circuits are represented in **circuit diagrams** using a standard set of **symbols:**



Rules for drawing a circuit diagram:

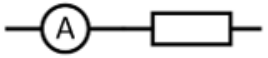
- Correct symbols must be used.
- All wires are drawn as straight lines.
- A pencil and ruler are used.



Lesson 2 – Series and Parallel

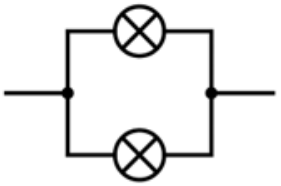
Connecting in series
Components are connected one after the other. The **current** must flow through each component **in turn**.

The ammeter is connected in series with the resistor:

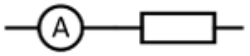


Connecting in parallel
Components are connected across each other in separate **branches**.
The current will flow through each component separately, **without** being affected by the other one.

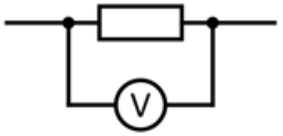
Two lamps are connected in parallel:



Ammeters
Measure **current** in Amps (A). Are always connected in **series**.



Voltmeters
Measure **potential difference** in Volts (V).
Are always connected in **parallel**.



Lesson 3 – Charge and Current

An electric current is a flow of charged particles. Each particle carries an amount of charge measured in Coulombs (C).

Current is the amount of charge that passes a point in a circuit each second.

$$charge\ flow = current \times time$$

$$Q = It$$

The standard units for these are:
Charge flow – Coulombs (C)
Current – Amps (A)
Time – seconds (s)

Sometimes values could be given to us in:
Current – milliamps (mA)
Charge – millicoulombs (mC)

"milli" means a thousandth.

$1\ mA = 0.001\ A$ $\qquad$ $1\ mC = 0.001\ C$

Example calculation:

Question: 900mC of charge flow through a lamp in a period of 30 seconds. Calculate the current.

Answer:

$$\frac{900}{1000} = 0.9\ C$$

$$Q = It$$

$$0.9 = I \times 30$$

$$\frac{0.9}{30} = I$$

$$I = 0.03\ A$$

Lesson 4 – Potential Difference

An **electric current** is a flow of charged particles. These particles transfer energy around the circuit.

Potential difference tells us how much energy the particles transfer as they pass through a component.

Potential difference is the energy transferred by each **unit of charge**.

$$energy\ transferred = potential\ difference \times charge$$
$$E = VQ$$

The standard units for these are:
Energy transferred – Joules (J)
Potential difference – seconds (s)
Charge – Coulombs (C)

Values could be given to us in:
Energy transferred – millijoules (mJ)
Potential difference – millivolts (mV)
Charge – millicoulombs (mC)

"milli" means a thousandth.

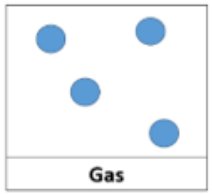
$1\ mV = 0.001\ V$ $\quad$ $1\ mC = 0.001\ C$

Lesson 5 – Modelling Circuits

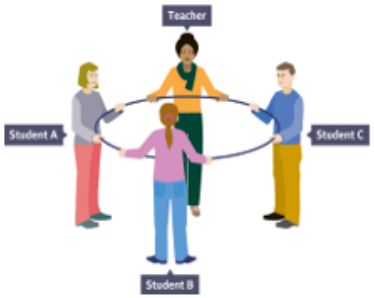
A **model** is a way to **visualise** something we cannot see.
To be **scientific**, a model must:

- Explain observations and results from **experiments**.
- Agree with other **scientific ideas** we know are correct.

The **particle model** is an example of a scientific model that you have seen before:



The **rope model** can be used to represent electric circuits:



The teacher represents the cell.

The students represent the other components.

The represents the electrons flowing as a current.

As **charged particles** flow through components, they experience **resistance**. This is shown in the rope model by the students holding the rope, making it harder to move.

Models have **limitations.** A limitation of the rope model is that it is difficult to model components connected in parallel.

Lesson 6 – Current, PD and Resistance

As **charged particles** flow through components, they experience **resistance**.

Resistance is measured in **Ohms (Ω).**

Potential difference, current and resistance are related by the equation:

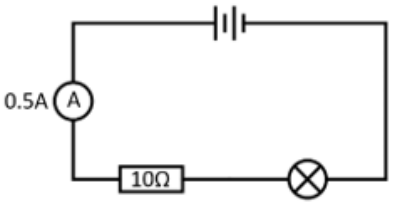
$$potential\ difference = current \times resistance$$
$$V = IR$$

The standard units for these are:
Potential difference – seconds (s)
Current – Amps (A)
Resistance – Ohms (Ω).

Increasing the resistance **decreases** the current.

If more components are added **in series**, the total resistance will be higher so the **current will decrease.**

Example calculation:
The ammeter reads 0.5A. The resistance of the lamp is 20Ω. Calculate the potential difference across the lamp.



$V = IR$
$V = 0.5 \times 20$
$V = 10\ V$

Lesson 7 – Errors in Circuits

Random errors
Errors that affect the results in **unpredictable ways.**

They are usually caused by a measuring **mistake** or a brief change in a **control variable**.

For example, the **reaction time** of someone using a stopwatch will not be the same for each measurement.

Systematic errors
Errors that affect **all** the results in the **same way**.

This means results will differ from the true value by a **consistent amount** each time.

A systematic error is usually caused by either a **zero error** on a measuring device or a fault in the method.

Zero errors
An example of a **systematic error** caused by a measuring device **consistently reading** too high or too low.

Can be seen when the device should be reading **zero** but isn't.

For example, this balance should be reading 0.0g (as there's nothing on it).

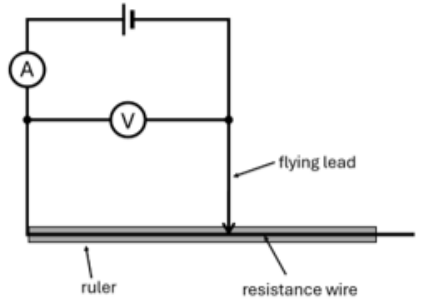
Lesson 8 – Resistance of a Wire

Two variables are **directly proportional** if changing one of them changes the other in the same way.

Pay and hours worked are **directly proportional** because doubling the number of hours worked would double your pay.

Plotting them on a graph produces a **straight line through the origin**.

To investigate how the length of a wire affects its resistance, we can use the circuit below:



The resistance can be calculated using the equation:

$$potential\ difference = current \times resistance$$
$$V = IR$$

When plotted on a graph, we find that the **resistance of a wire is directly proportional to its length**.

Lesson 9 – Accuracy and Precision

Accurate results are close to the true value.

Precise results are close together with a small range.

The ***resolution*** of a measuring device is the smallest change it can measure.

This voltmeter has a resolution of 0.1V.

Smaller resolution numbers equate to a **higher resolution**.

This second voltmeter has a resolution of 0.01V.

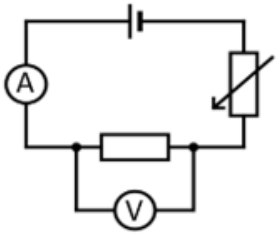
It should give more **accurate** readings because it has a **higher resolution**.

This third voltmeter has a resolution of 0.2V.

It should give the **least accurate** readings out of the three as it has the **lowest resolution**.

Lesson 10 – IV Characteristics 1 - Resistors

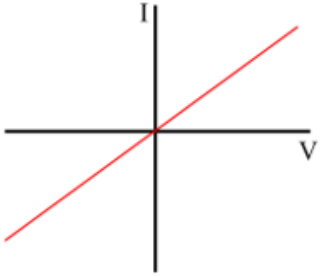
An IV Characteristic is a graph of **potential difference** (x-axis) against **current** (y-axis).
It describes how a component **behaves** in a circuit.



This circuit can be used to obtain an IV Characteristic for a **resistor**.

The variable resistor changes the **resistance** of the circuit. This changes the **current** and **the potential difference** across the resistor.

When plotted, the result is:



This shows that the current is **directly proportional** to the potential difference.

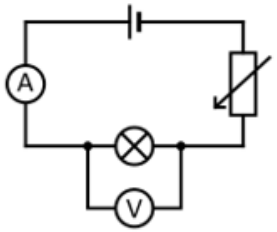
Ohm's Law states:
The current through a conductor is directly proportional to the potential difference across it, as long as the temperature remains constant.

This means it is important to keep the temperature of the resistor constant by:

- Switching off the circuit in between readings
- Keeping the current low

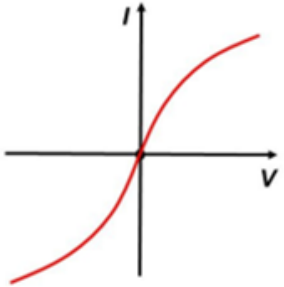
Lesson 11 - IV Characteristics 2 - Lamps

This circuit can be used to obtain an IV Characteristic for a **filament lamp**.



It is the same circuit as we used for the resistor in lesson 10.

However, the results for a filament lamp show a **curve**:



This shows that the current is **not** directly proportional to the potential difference.

Filament lamps do not obey Ohm's Law.

This is because the **temperature** of the filament was not constant.

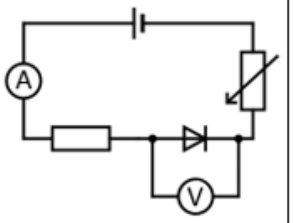
Resistance is caused by collisions between **electrons** and the **metal ions**.

As the potential difference increases, the **temperature** of the filament **increases**.

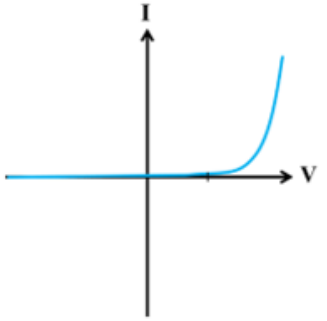
This causes the **ions** to vibrate more, which causes **more collisions**, increasing the **resistance**.

Lesson 12 - IV Characteristics 3 - Diodes

The circuit must contain a resistor to limit the current through the diode and prevent it being damaged.



The IV Characteristic for a diode looks like:



Diodes do not obey Ohm's Law.

The **current** through the diode when it was connected in the reverse direction was **zero**.

This tells us that the **resistance** of a diode is **very high** in the **reverse direction.**

However, diodes have a **low resistance** in the **forwards direction**.

Therefore, diodes only let **current** flow through them in **one direction**.

Diodes can be used to **protect** devices from current flowing the wrong way.

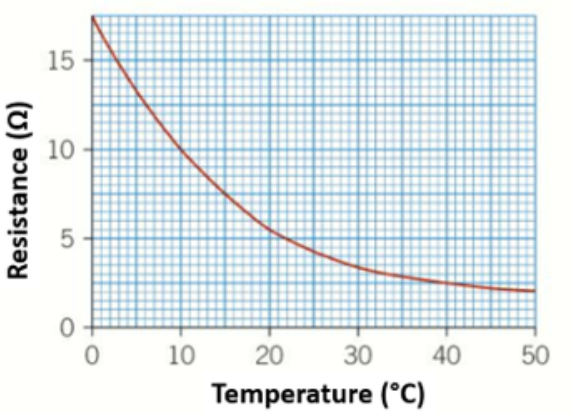
LEDs are also a type of diode.
LED stands for **Light Emitting Diode**.

Lesson 13 - Thermistors

A **thermostat** controls the heating in a building by sensing the **temperature** using an electronic component.

This component is called a **thermistor.**

The **resistance** of a thermistor depends on **temperature**.



As the temperature **increases**, the resistance of the thermistor **decreases**.

Thermistors are used to sense temperature in places like ovens and electronic devices.

Review questions Lessons 1-6

1. Draw the circuit symbols for a cell, resistor and lamp.
2. Explain the difference between connecting components in series and in parallel.
3. How are ammeters connected in a circuit?
4. How are voltmeters connected in a circuit?
5. What is an electric current?
6. What units are current and charge measured in?
7. How do you convert from milliamps (mA) to Amps (A)?
8. Define potential difference.
9. Give two examples of scientific models.
10. State the units for resistance.
11. Describe how increasing the resistance affects the current in a circuit.
12. State the equation that links current, potential difference and resistance.
13. The potential difference across a 25Ω resistor is 2.0V. Calculate the current through the resistor.

Review questions Lessons 7-13

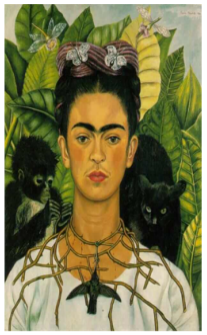
1. What is a random error?
2. What is a systematic error?
3. What does a graph showing two things that are directly proportional look like?
4. Describe how the length of a wire affects its resistance.
5. Explain the difference between accurate and precise results.
6. Explain what is meant by the resolution of a device.
7. Describe how resolution affects accuracy.
8. State Ohm's Law.
9. Give examples of components that do and do not obey Ohm's Law.
10. Sketch the IV Characteristic for a filament lamp.
11. Sketch the IV Characteristic for a diode.
12. Describe how a diode affects the current in a circuit.
13. How does the temperature affect the resistance of a thermistor?
14. Sketch the circuit symbol for a thermistor.
15. Give some examples of where thermistors are used.

Year 9 Art Cycle 2 Knowledge Organiser
Self Expression & Symbolism

Threshold Concept:
Artists use self expression and symbols to convey identity and ideas.

1. Celtic Art
Book of Kells 800 A. D.

2. Vanitas Still Life
Pieter Claesz 1625



3. Frida Kahlo -Self Portraits 1940

4. Andy Warhol 1962
Gold Marilyn Monroe

5. Glen Ligon
Self Portrait 2004 & 'Runaways' 1993

6. Kervin Brisseaux
Digital Illustration 2022

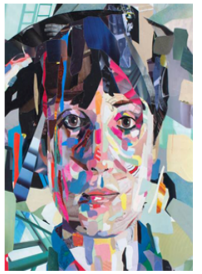
Art History- Key Facts:

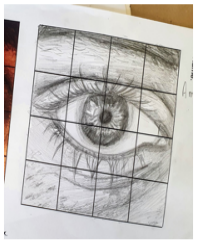
1. **Book of Kells:** Monks in Ireland created an illuminated Bible called the 'Book of Kells' between the 6th and 8th centuries. They used animals for symbolism. For example the snake was perceived as a symbol of Christ's resurrection: it was 'reborn' when it shed its skin
2. **Vanitas:** The word Vanitas is Latin for "vanity". A vanitas is a symbolic work of art reminding us that our vanity or material possessions do not preclude us from death, which is inevitable. These artworks were common in the 16th and 17th centuries. Common symbols include skulls, (representing death); rotten fruit (decay); smoke, watches (time) musical instruments, fruit, flowers and butterflies (the cycle of life).
3. **Frida Kahlo**: Frida Kahlo was a Mexican artist known for her self-portrait paintings using symbolic elements to express her feelings and personal experiences. After periods of ill health and depression she surrounded herself with animals. Her paintings include monkeys, dogs, cats and hummingbirds that she used as symbols for protection. In *Self-Portrait with Thorn Necklace & Hummingbird,* the hummingbird was placed in her necklace. The hummingbird symbolizes hope and good luck in Mexican culture.
4. **Andy Warhol :** Andy Warhol repeated Monroe's image (and other celebrities) over and over again as a symbol of his fascination with a society in which identity can be manufactured, commodified, and consumed like products.
5. **Glen Ligon:** Glen Ligon is an American conceptual artist whose work explores race, and identity. 'Runaways' was an artwork symbolising how slavery continues to be important today.
6. **Kervin Brisseaux:** Kervin Brisseaux is an illustrator & creative director. His style is influenced by fashion, music, and anime. He uses symbols to represent youth and street culture.

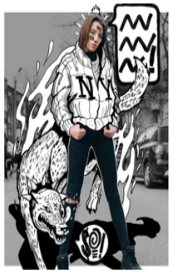
Year9 Art Cycle 2 Knowledge Organiser: Self Expression & Symbolism

Key terms & techniques:

1. **Celtic Illumination**: Monks created an illuminated Bible between the 6th and 8th in Ireland. Its clever use of symbolism tells the story of Christianity, through decorative illustrations.
2. **Collage:** (also known as Photomontage) Collage is a technique named after the French word 'coller' meaning 'to glue'. It is a process in which paper, photographs or fabrics are arranged and stuck down onto a surface.
3. **Grid drawing :** is a technique that involves placing a grid over a reference photo and drawing surface, then using that grid to assist with the placement of your drawing. This method is a useful for drawing an image accurately.
4. **Identity:** Identity is the appearance, beliefs, personality traits, or expressions that characterise a person or group.
5. **Mood board:** A mood board is a type of visual presentation or 'collage' consisting of images, text, and samples of objects in a composition. It can be based on a set topic or can be any material chosen at random. A mood board can be used to convey a general idea or feeling about a particular topic. They may be physical or digital, and can be effective presentation tools.
6. **Tints & Shades:** In painting light & dark colours can be mixed by adding different amount of white or black with a colour . A tint is made by adding colour to white paint. A shade is made by adding black to a colour.
7. **Self Expression:** to convey your personality, opinions or emotions (through art).
8. **Stencil :** A design is cut out of card, plastic or metal and then the image is transferred to a surface with the use of a spray, sponge or roller to apply the paint.
9. **Symbol:** In art, a symbol is something recognizable that stands for or represents something else.
10. **Symbolism:** Symbolism is the art of using an object, image, colour or word to represent an idea. Symbolism was both an artistic and a literary movement that suggested ideas through symbols and emphasized the meaning behind the forms, lines, shapes, and colours.







Computer Science

Year 9 - Algorithms Knowledge Organiser

Computing

Designing an Algorithm

- An algorithm is a plan, a logical step-by-step process for solving a problem. Algorithms are normally written as a flowchart or in pseudocode.
- The key to any problem-solving task is to guide your thought process. The most useful thing to do is keep asking 'What if we did it this way?' Explor-ing different ways of solving a problem can help to find the best way to solve it.

Binary Search

Binary search is a faster method for searching for an item that is in an ordered list.
An ordered list is one where the sequence of items in the list is important. An ordered list does not necessar-ily contain a sequence of numbers (e.g. 1, 2, 3, 4) or char-acters (eg A, B, C, D).
It might also contain, e.g. a list of names in alphabetical order, a list of files from smallest to largest or a list of records from earliest to most re-cent.

Positives and Negatives of a Binary Search

One of the main advantages of a binary search is that it is much quicker than a serial search because the data that needs to be searched halves with each step.

For example, it is possible to search through 1024 values and find the one you want within 10 steps, every time.

The biggest problem with a binary search is that you can only use this if the data is sorted into an order.

Why do we need Searching Algorithms

Searching for data can be very difficult. Searching al-go-rithms, such as serial search and binary search, make the process of searching for data much easier.

We often need to find one particular item of data amongst many hundreds, thousands, millions or more. This is why searching algorithms are important. Without them you would have to look at each item of data, individually. In a large set of data, it will take a long time to do this. Instead, a searching algorithm can be used to help find the item of data you are looking for.

Bubble Sort

A bubble sort algorithm goes through a list of data a number of times, comparing two items that are side by side to see which is out of order. It will keep going through the list of data until all the data is sorted into order. Each time the algorithm goes through the list it is called a 'pass'.

Positives and Negatives of a Bubble Sort

One of the main advantages of a bubble sort is that it is a very simple algorithm to describe to a computer. There is only really one task to perform (compare two values and, if needed, swap them).

This makes for a very small and simple computer program.
The biggest problem with a bubble sort is that it takes a very long time to run. For example, if there are 100 val-ues to sort, each pass through the list will take 99 com-parisons – and you might have to repeat it 99 times.

Key Vocabulary

Binary Search
A method of searching in which the data being searched is halved with every step.
Criteria
Singular - criterion. A set of rules or conditions that must be met. Often used in searches.
Flowchart
A diagram that shows a process, made up of boxes representing steps, decision, inputs and outputs.
Sorted
When things are put into order, eg largest to Smallest.
Bubble Sort
A sorting algorithm that repeatedly passes through a list to be sorted, comparing and swap-ping items that are in the wrong order.
Algorithm
A sequence of logical instructions for carrying out a task. In com-puting, algorithms are needed to design computer programs.
Program
Sequences of instructions for a computer.programs.

Serial Search

Searching for a keyword or value is the foundation of many com-puter programs. The most basic kind of search is a serial search. Criteria are set up before the search begins. The search then starts with the first item and then moves to each item in turn, until either a match is found or it reaches the end of the data with no match found.

Positives and Negatives of a Serial Search

One of the main advantages of a serial search is that it is a very simple algorithm, which makes it very easy to write a computer program to carry it out. It can also be used on any set of data regardless of type and whether or not it is sorted.

The biggest problem with a serial search is that it is very slow. For example, when searching through a database of everyone in the UK to find a particular name, it might be necessary to search through 60 million names before you found the one you wanted.

Computer Science

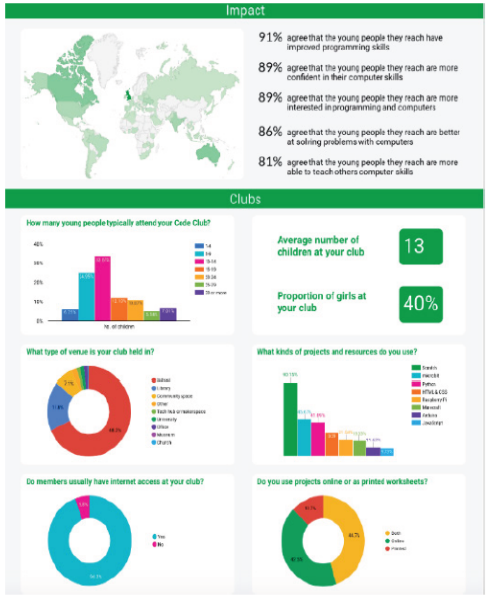
Year 9 - Data Science Knowledge Organiser

Computing

What is Data Science

Data science is extracting meaning from large data sets in order to gain insights to support decision-making

Infographics versus data visualisations
Data visualisations are visual representation of data (such as charts and graphs) intended to help an audience process the information more easily and get a clear idea about the data at a glance. Infographics are visual representations of data, often involving pictures that reflect patterns and help tell a story. Infographics can include visualisations.



What about anomalies?

Data that sits outside a trend is known an **outlier.**
Outliers can cause problems when working out statistics such as the mean, but they shouldn't be removed from the data set without investigating the reason for them.

Data Cleansing
Once data has been collected it should be checked through it to see if it needs cleansing. Cleansing involves detecting and correcting, or removing, corrupt or inaccurate data. There are several thinks that need to be checked when cleansing data, this will help to make sure the data set is accurate and robust.
Missing values
Is there some data missing on the data set, how would this affect the results of the research?
Duplicate entries
Duplicate data can happen when the same data has been entered twice in the dataset. This has often been entered mistakenly and will need to be removed or corrected during the data cleansing process.
Invalid data
This could be data outside the normal range that would be expected. For example if someone had their height recorded as over 3 meters tall then this would clearly be a mistake or inaccurate data. Also a persons age could be recorded as zero, this again isn't possible and would be inaccurate data and should be either corrected or removed.

Statistics

A correlation shows that there is a relationship between two or more variables. For example data could indicate a clear upwards trend, showing that there is a relationship between the two **variables**; we call that a **correlation**. This would be an example of a **positive correlation**, meaning that as one variable increases, the other one increases too.

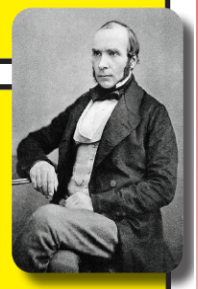
However correlation doesn't always mean causation
A **correlation** shows that there is a relationship between two or more variables, but that doesn't guarantee that one causes the other.

For example, there is likely to be a correlation between ice cream sales and the weather. Does that mean that ice cream sales cause hot weather? The correlation doesn't guarantee that one causes the other.

Key Vocabulary

Analysis
A through study doing a careful analysis of a problem.
Causation
This is when one variable influences another.
Correlation
Shows that there is a relationship between two or more variables.
Data visualisation
Representation of data with charts and graphs to help the audience process the information easily.
Infographics
Visual representations of data, often involving pictures.
Outlier
A data point on a graph or in a set of results that is very much bigger or smaller than the next data point.
Positive correlation
A relationship between two variables that tend to move in the same direction.
Variable
Something that may or does vary or change.

Jon Snows Visualisation



In 1854 there was an outbreak of cholera in the Soho area of London. At the time it was widely believed that cholera was caused by pollution in the air.

John Snow's observation of the evidence led to him discounting this belief, but he could not prove how people did become infected. John Snow made a dot map of Soho. The dots (or shaded-in parts) on the map represent where a cholera-related death had occurred. John Snow highlighted on the map the position of a water pump on Broad Street.

This data visualisation helped him to prove his theory that all the deaths had been of people who had used this water pump for drinking water. This map helped convince the local council to immediately remove the pump handle. Many lives were saved.

Using ICT

Year 9 Business Letter & Database

Computing

Business Letter Layout

Below is an exmple of how your business letter should be laid out. Choose a sensible font and ALWAYS remember to proof read your work to check there are no errors.

Business Letters

A business letter is a formal document often sent from one company to another or from a company to its clients, employees, and stakeholders. Business letters are used for professional correspondence between individuals, as well.

Although email has taken over as the most common form of correspondence, printed-out business letters are still used for many important, serious types of correspondence, including reference letters, employment verification, job offers, and more.

Kingsbridge Community College
Balkwill Road
Kingsbridge
TQ7 1PL

Your address

Today's Date

12 December 2019

One blank line space between paragraphs

Name and address of the person your sending the letter to.

Addressee's Name
Addressee's Address Line 1
Addressee's Address Line 2
Addressee's Postcode

Salutation: Could be Dear Sir/Madam if you do not know the name of the person

Dear *Addressee's Name*

The subject of the letter (must be in BOLD)

Welcome to our Charity Event

All Text Left Aligned

First Paragraph. You will introduce yourself and explain why you are writing to them. No more than a few sentences are required. You should use some persuasive language to impress upon the business's the importance of the community event. Make sure you leave 1 line space between each of your paragraphs.

Second Paragraph. Here you could explain your event, e.g. locations/distances/dates and times/. You could also explain your chosen charity and why they are important.

Third Paragraph. You need to explain how to sign up for the event. Make sure you are clear that it must be in teams of 4. You could also include the price of the event and the awards/medals that can be won.

Yours sincerely

4 Line Spaces

If you wrote their full name at the top use, sincerely. If you wrote Dear Sir Madam use: Your faithfully

[insert your name]
[insert your position]

Your Name typed in BOLD

Database Fields

Database fields are the containers that store pieces of information or data in database tables.

In the Competitors Database, we need to be able to store certain pieces of information from each competitor.

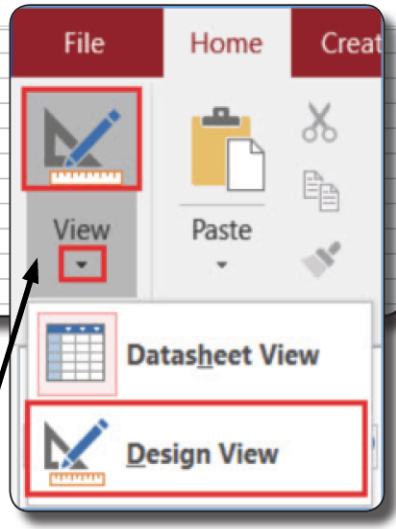
We also have to consider what type of information will be entered into the fields we have created. This is called **Data Type.**

Field Name	Data Type
Customerid	Number
Title	Short Text
Forename	Short Text
Surname	Short Text
Address1	Short Text
Address2	Short Text
County	Short Text
Postcode	Short Text
gender	Number

General | Lookup

Field Size
Format
Decimal Places
Input Mask
Caption
Default Value
Validation Rule
Validation Text
Required
Indexed
Text Align

How to change Views



Data Type

There are several diferent kinds of Data Type...

Text	Letters, symbols and numbers, i.e. Alphanumeric data
Number	Numbers only (no letters). Includes numbers with decimal points.
Date/Time	Dates and times.
Currency	For all monetary data. Access will insert a currency symbol before the amount (£)
Yes/No	Used wherever the field can only take 2 values, Y/N, True/False etc.
AutoNumber	This is a unique value generated by Access for each Record.

Key Words

Database
Fields
Data Type
Table
Lookup Wizard
Datasheet View
Field name
Primary Key
AutoNumber
Validation
Align
Salutation

Year 9 – Unit 3
Blood Brothers

Symbols and Motifs

Guns are a recurring symbol throughout the play. Firstly, they are shown as harmless toys, part of games that the children play. Then they become more mischievous, as Mickey, Edward and Linda play with an air gun and are reprimanded by the police. Finally, Sammy's gun in the robbery puts Mickey in prison and becomes the weapon that kills Edward. They represent violence, and the transition from childhood to adulthood.

Edward's locket is a symbol which represents secrets. Mrs Lyons wants to see the locket but the irony is that she is guarding a far bigger secret. The locket also represents the power of motherhood – Edward is drawn to Mrs Johnstone even though he does not know her relationship to him.

Marilyn Monroe is a recurring symbol within the play – Mrs Johnstone's husband was attracted to her because she looked like the film star, but when she starts to age he finds a replacement. A tragic figure, Marilyn Monroe is significant because she combined sexuality, vulnerability and secrets.

Language and Techniques

audience address
chorus
Colloquial
contrast
dramatic Irony
emotive language
foreshadowing
irony
juxtaposition
metaphor
refrain
repetition
rhyming Couplet
song
tragedy

Context

Set in the 1970s and 80s, Blood Brothers shows the realities of life in Liverpool during the era. In 1979, Margaret Thatcher came to power as Prime Minister and privatised much of Britain's manufacturing industry. As a result, there was widespread unemployment; in Liverpool, up to 25% of the population were unemployed. This led to high levels of poverty.

The Johnstone family, and in particular Mickey's redundancy, show the real life impact of this. Russell uses the play to explore the consequences of poverty and unemployment. As a Liverpudlian himself, he was writing from first-hand experience.

Key Vocabulary

act
deprivation
education
inequality
maternal
nature
nurture
playwright
recession
social divide
superstition
stage directions

Characters

Mrs Johnstone: A single mum, Mrs Johnstone has lots of children and looks older than she is. She works as a cleaning lady and is desperate to provide for her family, but often struggles. She is warm and caring, and spends her life regretting her decision to give away Edward.

Mrs Lyons: A wealthy, middle-class woman, Mrs Lyons is desperate for children. She is lonely because her husband is often away on business. She is cunning, as she hatches a plan to pass one of the twins as her own. She pays for her decision by becoming paranoid that the truth will come out, and increasingly jealous of Mrs Johnstone. She lacks maternal warmth.

Mickey: One of Mrs Johnstone's twins, his life is often chaotic. He is suspended from school, gets his girlfriend, Linda, pregnant, loses his job, goes to prison, becomes addicted to anti-depressants and eventually kills his own brother. Mickey shows us how the choices we get in life can define who we become.

Edward: The twin that Mrs Johnstone gives away, Edward is raised in a privileged lifestyle, with private school and a university education. He gets a good job and eventually wins over Linda. However, he never experiences the maternal kindness that Mickey experiences.

Linda: Boisterous and fun-loving, Linda falls in love with Mickey and is fiercely loyal to him. She stands up for him against teachers and against Sammy, but his eventual decline sends her into Edward's arms. She feels trapped by the life that has been created for her with Mickey.

The Narrator: The Narrator stays on stage throughout the play, commenting on and narrating events. He asks the audience to speculate about who is to blame for the events in the play, and often appears as a minor character to remind Mrs Johnstone of her guilt at giving away her son.

Sammy: Mickey's older brother is a violent bully who exhibits aggressive behaviour throughout the play. At first, Mickey looks up to him, but eventually he becomes a threat. It is Sammy who involves him in the robbery and who unwittingly provides the gun which Mickey uses to kill Edward.

Mr Lyons: A wealthy, middle-class businessman, Mr Lyons has no understanding of his wife's desperation for a baby, or her deep paranoia about Edward. He is dismissive about her worries. He also shows no care for his employees, whom he makes redundant in Act II.

Themes

Nature vs Nurture

- Splitting up Edward and Mickey at birth shows us how environment can have a huge impact on life chances.
- The boys continue to be drawn to each other, despite very different upbringings.
- Mrs Johnstone is shown as having a natural maternal instinct, while Mrs Lyons seems unable to show easy motherly love. This has an impact on the boys and ironically drives Edward towards Mrs Johnstone.

Violence

- Mickey is exposed to violence from a young age, in the games played by his friends and by Sammy.
- Sammy is frequently violent to others and it is his violent tendencies which lead to Mickey going to prison.
- Mrs Lyons resorts to violence when she threatens Mrs Johnstone.
- Mickey resorts to violence at the end of the play when he finds out the truth.

Growing Up

- Mickey and Edward's childhoods are juxtaposed throughout the play to show how childhood experiences can be very different and yet very similar.
- Mrs Johnstone and Mrs Lyons react to their children growing up in different ways.
- The montage in Act II shows the transition from childhood to adulthood.
- Mickey realises that some people have to grow up quicker than others, due to their circumstances.
- The play shows how two children with similar backgrounds (Sammy and Linda) can make different choices and take different paths in life.

Fate and Superstition

- We are told how the story will end at the beginning of the play – so there is no escaping the fate of the blood brothers.
- The play considers how one decision can decide a person's fate – Mickey realises at the end of the play that he could have had Edward's life if Mrs Johnstone had chosen differently.
- Mrs Johnstone is highly superstitious at the beginning of the play, and Mrs Lyons uses this to create the superstition about twins who are parted.
- Mrs Lyons becomes superstitious as her paranoia takes over.
- The Narrator asks us if superstition is to blame for boys' fate.

Class

- Willy Russell shows us the injustices of the class divide by juxtaposing the upbringing of Edward and Mickey.
- Accents, vocabulary and costume are used to show the class divide between the two boys and their mothers.
- Education is shown as a key factor in the class divide: Edward's education guarantees him university and a good job; Mickey's education is largely pointless and reduces his chances in life.
- The Narrator asks us if class is to blame for the boys' fate.

Friendship and Loyalty

- Edward and Mickey forge a friendship which bridges the class divide.
- That friendship is destroyed by Edward's inability to understand the pressures of money problems – ultimately the class divide comes between them.
- Linda shows loyalty to Mickey throughout her life, standing up for him against bullies. But when Mickey becomes unreachable, she betrays him.

Year 9 – Unit 4
Romeo & Juliet

Themes

Love • Passionate, chaotic love is pitched against the 'order' of courtly love. • Love often leads to violence.	**Fate** • No matter what they do, the characters cannot escape their fate. It is the determination of Romeo and Juliet in the face of fate that conveys how fiery the love between them is.
Individuals V Society • Forbidden love forces Romeo and Juliet to turn against the conformity of the society their live in.	**Language and Word Play** • Constant play on language, using pun, rhyme and double-entendre. • Romeo and Juliet seem to use word play to escape from the world, their act of rebellion.
Violence and Conflict • Driving force in the play. • Occurs between several characters. • Opens the play and concludes it with the deaths of Romeo and Juliet.	**Death** • Society was much more comfortable with the idea of death than we are now. • Death is mentioned and referenced throughout the play.

Prologue

Key Vocabulary		Language and Techniques
patriarchy	Verona	prologue
Elizabethan	conspire	foreshadowing
character	ambiguity	dramatic irony
society	predicament	bawdy humour
violence	unease	monologue
conflict	suicide	soliloquy
resolution	brawl	oxymoron
civil unrest	relationship	metaphor
marriage	adversity	simile
catholic	provoke	imagery
Catholicism	mutiny	iambic pentameter
Shakespeare	adversary	juxtaposition
		tragedy
		antagonist
		blank verse
		sonnet
		sonnet form
		suspense

Characters

Characters:

Romeo Montague – Son of the Montague family.

Juliet Capulet – Daughter of the Capulet family.

Mercutio – Friend to Romeo – neither Capulet nor Montague.

Tybalt – Juliet's Cousin, a prominent Capulet.

Benvolio – Romeo's cousin.

Friar Lawrence – A Franciscan monk and friend to both families.

Nurse – Juliet's confidante, very close to her, motherly.

Prince Escalus – Leader of Verona, trying to keep peace between the families.

Lesson 1: UK Landscapes

Relief is the physical features of a landscape. This includes the height above sea level, steepness of slopes and shapes of different landscape features.

North and West have highland areas +600m: These are made of igneous and metamorphic rock: eg **Dartmoor** and **Pennines, Grampians**

South East are **lowlands** areas -200m: Flat or rolling hills. Made from sedimentary rock.

Relief of the UK can be divided into uplands and lowlands. Each have their own characteristics.

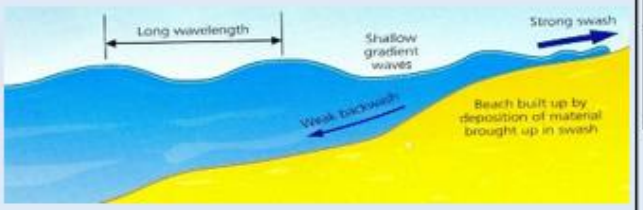
Uplands	Lowlands
800 m	800 m
600 m	600 m
400 m	400 m

1. What term describes the height and shape of the land?
2. Which areas of the UK are mainly uplands?
3. What rock type are the Uplands made from?
4. Which areas of the UK are lowlands?
5. How high are the upland areas?

Lesson 2: Waves

Waves are created by **wind blowing** over the surface of the sea. As the wind blows over the sea. The size of the wave is determined by the strength (speed) of the wind, time over which it blows and distance (fetch) it blows over.

Constructive Wave
This wave has a **swash that is stronger** than the backwash. This therefore builds up the coast.



Destructive Wave
This wave has a **backwash that is stronger** than the swash. This therefore erodes the coast.

1. What creates waves?
2. What are the 2 types of wave called?
3. Which wave has a strong backwash?
4. Which wave has a long wavelength?
5. Which wave erodes the coast?

Lesson 2: Erosion

Erosion is the break down and transport of rocks – smooth, round and sorted.
Types of erosion:

Attrition	Rocks that bash together to become **smaller and smoother**
Solution	A chemical reaction that **dissolves rocks.**
Abrasion	Rocks hurled at the base of a cliff like a sandpapering action that cause it to become **smoother**.
Hydraulic Action	Water enters cracks in the cliff, or river bank, **air compresses**, causing the crack to expand.

1. What is erosion?
2. What type of erosion involves the dissolving of rocks?
3. What type of erosion causes rocks to become smaller and smoother?
4. What happens to air when it is forced into cracks in the process of hydraulic action.
5. What type of erosion is like a sandpapering action?

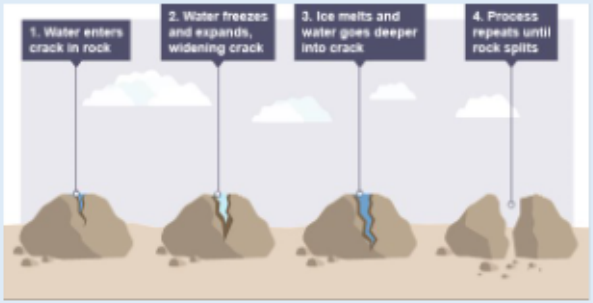
Lesson 3: Weathering

Weathering is the breakdown of rocks where they are (in situ).

Biological	Breakdown of rock by **plants** and **animals** e.g. roots pushing rocks apart.
Mechanical/ Physical	Breakdown of rock without changing its chemical composition e.g. **freeze thaw**
Chemical	Chemicals (acids) react with the rocks (limestone). e.g. as carbonation

Freeze-thaw weathering

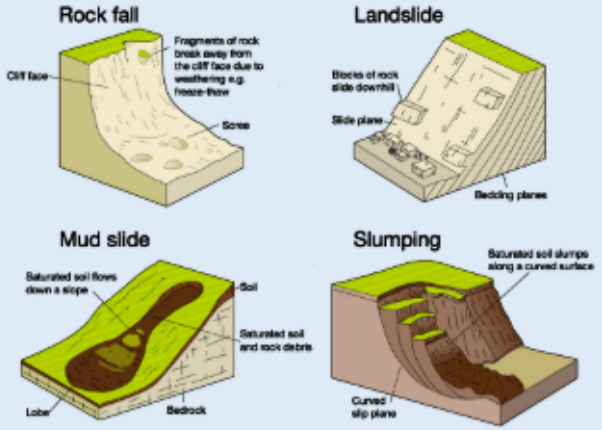
Freeze-thaw weathering occurs when rocks are **porous** (contain holes) or **permeable** (allow water to pass through).



1. What is weathering?
2. How many types of weathering are there?
3. Physical weathering is also known as what type of weathering?
4. What type of rock is easily weathered by chemicals?
5. Freeze-thaw is an example of what type of weathering?

Lesson 3: Mass Movement

Mass movement is a large movement of soil and rock debris that moves **down slopes** in response to the pull of **gravity** in a vertical direction.



Rockfall – fragments of rock beak away from the cliff face, often due to freeze-thaw weathering.
Landslide – blocks of rock slide downhill
Slumping/ Rotational Slip– slump of saturated soil and weak rock along a curved surface.
Mudflow – saturated soil and weak rock flows down a slope.

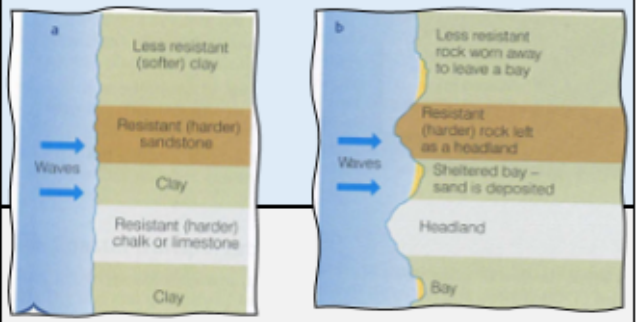
1. What force causes soil to move down slope?
2. How many different types of mass movement are there?
3. What type of mass movement might occur due to freeze-thaw weathering?
4. What type of mass movement occurs along a curved surface?
5. What type of mass movement produces scree?

Lesson 4: Headlands and Bays

A **headland** is a rocky coastal highpoint of land made of rock that is resistant to erosion.
A **bay** is an area of less resistant rock where the land has been eroded by the sea.

Formation of Headlands and Bays:

1. Coastlines can be made of alternating bands of hard and soft rock.
2. These rock types will erode at different rates.
3. Headlands form where more resistant (hard) rock such as limestone or sandstone is eroded slowly.
4. Bays form where weaker (soft) rock such as clay erode more easily through processes of hydraulic action and abrasion.
5. Bays are sheltered areas and so deposition takes place to form beaches.
6. Headlands are dominated by high energy on the land sticking out, so erosional landforms are found at headlands.



1. What landform is made of hard rock?
2. What landform is made of soft rock?
3. What 2 types of erosion help to form the bays?
4. Give an example of a hard rock type.
5. Give an example of a soft rock type.

Lesson 5: Cliffs and Wave Cut Platforms

A **wave cut platform** is a rocky, level shelf at or around sea level representing the base of old, retreated cliffs.
A **cliff** is a steep high rock face formed by weathering and erosion.

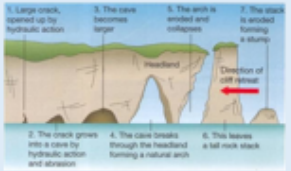
Formation of Cliffs and Wave Cut Platforms:

1. The sea erodes the cliff through **processes** such **as hydraulic action and abrasion.**
2. This forms a **wave-cut notch** between high and low water.
3. Over time the **cliff is undercut** and eventually **collapses** due to the force of gravity.
4. The process is repeated with the cliff **retreating over time.**
5. At the base of the cliff a **wave-cut platform** is formed.
6. This is an area of **flat rock that extends into the sea.**
7. This is exposed at **low tide.**

1. What is defined as a rocky shelf at the base of an old cliff?
2. What feature forms between the high and low water mark?
3. What 2 types of erosion help form a wave cut platform?
4. What word describes the position of the cliff moving back?
5. What causes the overhang to collapse?

Lesson 6: Cave, Arch, Stack and Stump (CASS)

Cave – A large hole in a cliff caused by waves forcing their way into cracks in the cliff face.
Arch – A wave-eroded passage through a small headland. This begins as a cave which is gradually widened and deepened until it is cut through.
Stack – Isolated pillar or rock left when the top of an arch collapses
Stump – The eroded remains of a sea stack.



Formation of Cave, Arch, Stack and Stump:

1. **Wave refraction** causes the waves to **erode** a headland from **both sides.**
2. **Hydraulic action** and **abrasion** erode a **crack**/ fault in the cliff.
3. This process continues to create a **cave.**
4. The waves continue to erode from both sides forming an **arch.**
5. The arch is **unsupported and** weathered from the top so the **roof of the arch collapses,** due to gravity.
6. This leaves a **stack.**
7. The **stack** is **weathered** and eroded and forms a **stump.**

1. What causes waves to erode a headland on both sides?
2. What erosion type is the force of water getting into cracks?
3. What is the name given to the part of the arch that collapses?
4. What comes first a stack or stump?
5. What happens to the position of the cliff (another term for moving back)?

Lesson 7: Transportation and Longshore Drift

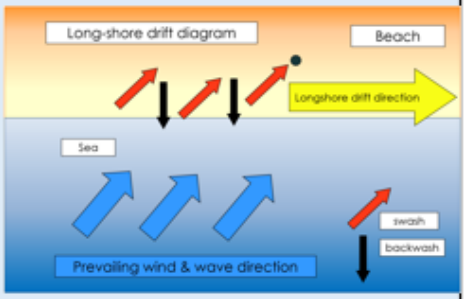
Transportation – the movement of eroded material.

Types of Transportation:

Traction	Boulders and pebbles are **rolled along** the sea bed during times of high wave energy (storms).
Saltation	Sand sized particles are **bounced** along the sea bed by the flow of water.
Suspension	Fine clay and sand particles are **suspended (float)** within the water.
Solution	Some minerals dissolve in water such as calcium carbonate. This requires very little energy.

Longshore Drift:

Transport of sediment along a stretch of coastline caused by waves approaching the beach at an angle, due to prevailing winds.



1. How many types of transportation are there?
2. Which type of transportation involves sand bouncing?
3. What type of minerals dissolve in solution?
4. What causes waves to approach the beach at an angle?
5. What term describes the movement of sediment along a coastline in a zig-zag pattern?

Lesson 8: Deposition and Beaches

Deposition- when material (sediment) being carried by sea water is deposited at points along the coast. **List of conditions for deposition to occur:**

Low/little energy environments
Sheltered bays
Waves are not very powerful/constructive waves
Large supply of sediment
Sea defences (e.g. Groynes) stop the movement of sediment

Beach: A beach is a landform of coastal deposition that lies between the high and low-tide levels. They can be made of sand, shingle, pebbles, mud and silt.

	Sandy Beach	Pebble Beach
Gradient	Generally shallow, almost flat	Generally steep
Dominant Wave	Constructive	Destructive
Distance inland	A long way	Not far
Back of beach	Sand Dunes (sometimes)	Storm beach with large pebbles

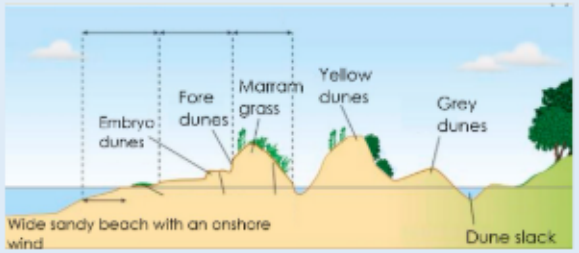
1. What is deposition?
2. List 3 conditions for deposition to occur.
3. What is a beach?
4. Which type of beach has a flat gradient?
5. Which type of beach is dominated by destructive waves?

Lesson 8 Sand dunes

Sand dunes – Coastal sand hill above the high tide mark, shaped by wind action.

Formation of sand dunes:

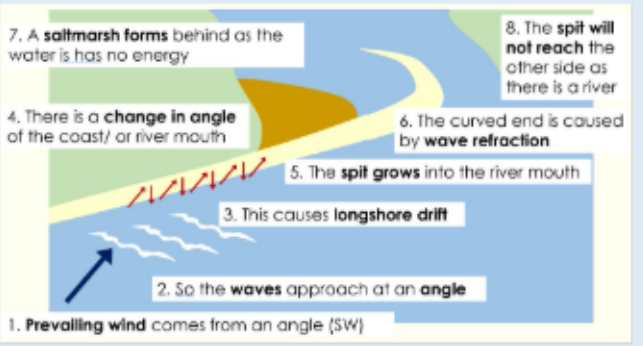
1. **Embryo dunes** form around **deposited obstacles** such as pieces of wood or rocks.
2. These develop and become **stabilised by vegetation** to form **fore dunes** and tall **yellow dunes**.
3. **Marram grass** is **adapted to the windy, exposed condition** and has long roots to find water. These **roots help bind the sand** together and stabilise the dunes.
4. In time, **rotting vegetation adds organic matter** to the sand making it more fertile. A much greater range of plants colonise these '**grey**' dunes.
5. Wind can come form **depressions** in the sand called **dune slacks**, in which ponds may form.



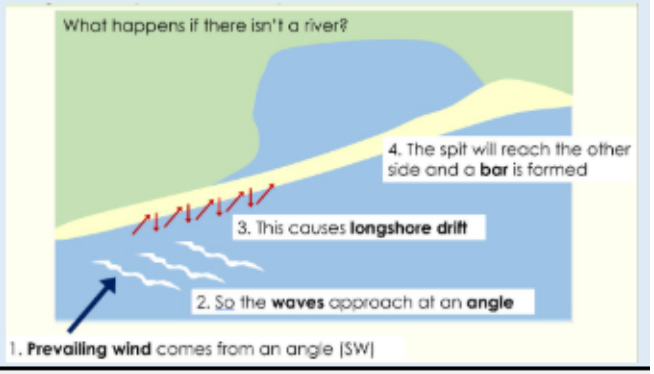
1. What is sand dune?
2. What is first required for sand to deposit around?
3. What type of grass is adapted to windy, exposed conditions?
4. What is a dune slack?
5. What is the name of the first dune that forms?

Lesson 9: Spits and Bars

Spit – Depositional landform formed when a finger of sediment extends from the shore out to sea, often at a river mouth.



Bar –



1. What is a spit?
2. What causes longshore drift?
3. What is a spit exposed to that causes it to have a recurved end?
4. What can form behind a spit?
5. What is a bar?

Lesson 10: Coastal Management	Lesson 11: Holderness	Key Terms
Hard Engineering: **Curved Sea Wall** (£5000-10,000 per m) ADV: Effective at stopping the sea. DISADV: Can look obtrusive and unnatural. **Groynes** (£150,000 each) ADV: Create a wider beach, which can be popular with tourists. DISADV: Starve beaches further along the coast of sediment. **Rock Armour** (£200,000 per 100m) ADV: Relatively cheap and easy to maintain. DISADV: Often do not fit in with the local geology. **Gabions** (£50, 000 per 100m) ADV: Can improve drainage of cliffs. DISADV: Cages only last 5-10 years before they rust. **Soft Engineering:** **Beach Nourishment and re-profiling** (£500,000 per 100m) ADV: Blend in with existing beach. DISADV: Needs constant maintenance. **Sand Dune Regeneration** (£200-£2000 per 100m) ADV: Maintains a natural coastal environment that is popular with people and wildlife. DISADV: Time consuming to plant the marram grass and fence areas off. **Managed Retreat** (Highly variable) ADV: Allows some land to flood. DISADV: Expensive to pay compensation.	**Location and Background** North East coast, Yorkshire. 61 km stretch of coastline, from Flamborough Head (headland in the north; hard resistant chalk) to Spurn Point (spit) in the south. Fastest eroding coastline in Europe – much of the softer rock (geology) is boulder clay; harder, resistant rock is loose unconsolidated clay. On average, 1.8m of coastline lost to erosion annually. **Processes and need for management:** Long shore drift moves sediment from north to south. Large rock groyne at Mappleton- resulting in a wider beach which reduces the rate of erosion and protects the village (cost £2 million in 1991). Bridlington – hard engineering has been put in place; a 4.7km sea wall plus groynes. Eastern side of Spurn Head spit has been protected with groynes and rock armour / rip-rap. **Resulting effects and Conflicts:** Groynes create **downdrift starvation** as longshore drift is interrupted and beaches to the south become narrower and erode more rapidly – houses in Skipsea have collapsed onto the beach. The Gas terminal at Easington (accounts for 25% of British gas) is 25m from the cliff and sea defences have been very expensive.	**Erosion** – the breakdown and transport or rocks – smooth, round and sorted. **Transportation** – The movement of eroded material. Deposition – When material is dropped by the sea losing energy. **Deposition**- when material (sediment) being carried by sea water is deposited at points along the coast. This happens when the sea has little or no energy in protected areas such as bays and river mouths. **Management** – The techniques of controlling an event. **Landform** – a natural feature formed by earths processes **Process** – Something that cause a change over time; physical or human. **Soft Engineering** – Managing erosion by working with natural processes to help restore beaches and coastal ecosystems. **Hard Engineering** – Using concrete or larger artificial structures to defend against natural processes, such as coastal flooding erosion and longshore drift.   
1. What are the 2 types of engineering? 2. Is rock armour an example of hard or soft engineering? 3. What is an advantage of a curved sea wall? 4. How much does it cost to re-profile the beach? 5. What is a disadvantage of managed retreat?	1. Where in England is Holderness? 2. What is the geology of the coastline? 3. What sea defence is in place at Mappleton? 4. What effect do groynes create? 5. How much does the gas terminal at Easington account for British Gas?	

Year 9 History Knowledge organiser - Cycle 1b – the rise of dictatorships. Treaty of Versailles, Communist Russia

A. Overview: This period was marked by struggles in much of the world, as Europe struggled to recover from the devastation of the First World War. Returning soldiers from the First World War felt let down by the governments resulting in revolutions. Many countries in Europe embraced radical ideas such as fascism and communism resulting in governments led by dictators.

The Russian Empire had a population of 181 million people in 1916. Many countries gained independence as a result of the Russian Revolution

B. The Treaty of Versailles, Russian Revolution

The Treaty of Versailles	A peace treaty signed by the allies in June 1919. Germany was forced to sign. This treaty did not bring about long-term peace, instead creating future problems
War-guilt clause	Under the terms of the Treaty of Versailles, Germany had to accept that they were responsible for the First World War
Diktat	The name given by Germany to the Treaty of Versailles. A dictated peace (not negotiated)
Reparations	Germany was forced to pay for damages for the First World War to Belgium and France. They had to borrow money from American banks to help them pay.
Communism	A political theory developed by Karl Marx and Friedrich Engels (also known as Marxism) which predicted that a workers' revolution was inevitable, and that capitalism would be replaced by a fair and equal society with a strong government
Capitalism	Economic system reliant on individual enterprise and business, trade and profits being made to re-invest. Capitalism in 19th century Britain and Russia saw many inequalities and much poverty
Revolution	Usually a violent overthrow of government. Russian revolution - 1917
The Bolsheviks	Communist party in Russia who led the October revolution. Led by Lenin. Trotsky was the military planner.
Civil War	After the October seizure of power there was civil war in Russia. The Bolsheviks won.

C. Key terms

Democracy	A form of government in which the people have the authority to choose their governing legislation
Dictator	A ruler with total power over a country, typically one who has obtained control by force
Treaty	A formally concluded and ratified agreement between countries
Tsar	King/emperor of the Russian Empire. Tsar (also spelt Czar) was forced to abdicate early in 1917
Police state	A country in which the government controls people's freedom by means of the police, especially secret police.
Terror	If you do not obey or protest then you could be arrested, even killed. Dictators use this as a method of control
Propaganda	To indoctrinate people into believing that the dictator/government was leading the country well. To follow without question. A method of control

E. Stalin's Russia

State-controlled industry	All the main industries were run by the government. Each industry was set targets that it had to reach in five years
Collective farming	Peasants were forced to hand over their land, animals and tools to a collective farm and work co-operatively. They had to give a lot of produce to the state
Purges	Stalin 'purged' all the people in the Communist party who might challenge his leadership. They were arrested and put on trial in public. They were sentenced and executed
Leadership cult	There were statues and paintings of Stalin everywhere. Propaganda, films and posters were designed to convince people that Stalin was the best person to guide them to a wonderful future

D. Key people, flags, map

Vladimir Lenin
Communist political leader who led the Bolsheviks to power in Russia 1917

Josef Stalin
Soviet politician who ruled the Soviet Union from the mid-1920s until his death in 1953. Was a Communist

Flag of the Union of Soviet Socialist Republics; 1922 to 1991

History

Year 9 History - Knowledge organiser - Cycle 1b – Interwar years – the rise of dictatorships. Fascist Italy and Nazi Germany.

F. Timeline of key events

11/11 1918	Armistice signed ending the fighting of World War One
28th June 1919	The Treaty of Versailles is signed, officially bringing World War One to an end
1919	A new political party is formed in Italy called the Fascist Party
January 1920	The new League of Nations meet for the first time
October 1922	Benito Mussolini starts his rule in Italy with the 'March on Rome'. initially as Prime Minister before later setting himself up as a legal dictator
January 1923	France and Belgium occupy the industrial region of the Ruhr in Germany over reparations
1923	Germany suffers from hyperinflation, causing huge social and economic problems
June 1929	Young Plan eases reparations burden but hated by many Germans
October 1929	Wall Street Crash – the American economy, including banks collapse. Leads to economic and political crisis in Germany
January 1933	Hitler becomes Chancellor of Germany. Over the next 18 months he establishes himself as dictator of Germany
1935-1939	Hitler begins to repeal terms of the Treaty of Versailles and gain territory whilst Britain and France follow a policy of appeasement in hopes of avoiding a new war
1939-1945	The Second World War begins when Germany invade Poland. During the Second World War the Holocaust happened. The allies won and Nazi Germany was defeated Mussolini's fascist Italy was also toppled. Stalin remained in place. Soviet Russia emerged as a super-power, start of Cold War

G. More key terms

Fascism Fascists	Political theory that sees a strong government (usually a dictatorship) and strong national identity which can lead to racism. Wants to gain greater equality for workers so appealed to the working class too. Mussolini's Italy and Hitler's Nazi Party were Fascists
League of Nations	International organisation created as a result of the Paris Peace Conference after the First World War to discuss and act on any conflicts, work on improving health and act on poverty. Significant weakness was that Germany was not allowed to join, Russia was expelled, USA not a member
Hyper-inflation	Inflation (price rise) of money at a very high rate. Money becomes almost worthless under hyperinflation. People's savings and pensions become worthless
The Depression	Economic recession caused by the Wall Street Crash, affected the world in 1930's, particularly the USA and Germany.
Blackshirts	Ex-soldiers from the First World War in Italy. Mussolini gave these soldiers a black uniform. They formed a paramilitary group who enforced fascist policies and helped Mussolini to power. They were angry about the First World War and poverty and unemployment in Italy
Totalitarian	Means that the state has control over every aspect of a person's life. A dictator is one person who makes all the decisions of government. Stalin, Mussolini and Hitler were totalitarian dictators
SS and SA	Paramilitaries in Nazi Germany. The SS carried out the atrocities of the Holocaust
Gestapo	Nazi secret state police who would arrest people
Anti-Semitism	Dislike or hatred of Jewish people. Fascist Italy and Nazi Germany had strong anti-Semitic policies
Fuhrer	Term used to describe the role of Hitler in Nazi Germany. Directly translated as 'pilot' or 'guide'
Cult of personality	Like Stalin, Mussolini and Hitler used propaganda to make their leadership seem infallible (could do no wrong)
The church (Christian)	As a powerful and moral institution, the church could have challenged these dictators. All dictators worked differently with the church. Stalin closed the churches and banned religion. Mussolini and Hitler worked with the church

H. Key people and flags

Benito Mussolini
Italian politician and journalist who founded and led the National Fascist Party. Ruled Italy as a dictator from 1922 to 1943

Adolf Hitler
German politician and leader of the Nazi Party and leader of Germany, 1933 to 1945

Josef Goebbels
German Nazi politician and Reich Minister of Propaganda of Nazi Germany from 1933 to 1945.

Flag of fascist Italy

Flag of Nazi Germany

Mussolini and Hitler

Knowledge organiser - Cycle 2 – WWII and the Holocaust

Key events

Date	Event
Jan 1933	Hitler becomes **chancellor** of Germany
1935	The Nuremburg Laws – Jews are no longer citizens of Germany and cannot legally marry Germans
Nov 1938	**Kristallnacht** (The Night of Broken Glass). 300 Jews killed; 30,000 arrested; 100 **synagogues** destroyed.
1939	WWII Begins - Germany invades Poland, Britain declares war
1940	**Evacuation** at Dunkirk. Over 300,000 soldiers are rescued from the beaches.
June 1941	Germany invades the Soviet Union. Soviet Union Join the war on the side of the **Allies**
Dec 1941	Japan bombs Pearl Harbor – a US Navy base. America joins the war on the side of the **Allies**.
1942	Wannsee Conference – The Nazi high command decide to carry out the **Holocaust.**
June 1944	D-Day: British, American and Canadian troops invade France, landing on beaches in Normandy
Apr 1945	Hitler commits suicide
May 1945	Germany surrenders. 8th May is VE Day – Victory in Europe.
Aug 1945	Dropping of **atomic bombs** on Hiroshima and Nagasaki. Japan agrees to surrender – 15th August VJ Day – Victory in Japan. WWII formally ends 2nd Sept.

Key terms

Key Word	Definition
antisemitism	Prejudice and discrimination against Jewish people
synagogue	Jewish place of worship
chancellor	Political leader of Germany. Equivalent to UK Prime Minister
Holocaust	The systematic attempt by the Nazis to murder all the Jews in Europe. Also referred to as the Final Solution.
Einsatzgruppen	Murder squads – sent into territory captured by the Nazis to round up and execute Jews. This was done by shooting.
ghettos	Areas of towns where Jews were forced to live in terrible cramped, unhygienic conditions with little food.
evacuation	Removing people from a place of danger to a safer place.
Allies	The alliance of countries that fought **against** Nazi Germany in WWII. Initially made up of Britain and France. USA and USSR would join in 1941.
Axis	The alliance of countries that fought **with** Nazi Germany. Initially Austria and Italy, Japan and others would join later.
atomic bombs	Nuclear bombs dropped on Japanese cities of Hiroshima and Nagasaki. They kill approximately 150-200,000 people and leave millions injured and homeless.
area/city bombing	Air raids that were aimed at whole cities rather than particular military targets. Carried out largely as WWII bombers were not accurate enough to hit smaller targets.
Bletchley Park	Also known as Station X. The site of Britain's codebreakers tasked with cracking German codes.
turning point	A time at which a decisive change in a situation occurs

Key People

Heinrich Himmler

Leader of the SS, Himmler's troops oversaw the concentration and death camps.

Elisabeth Volkenrath

One of many female guards in Auschwitz, Volkenrath was executed by the **Allies** for her part in the **holocaust**

Commander 'Bomber' Harris

British leader of bomber command, he was responsible for pushing the concept of area or city bombing. He is seen as a very controversial figure and blamed for thousands of civilian deaths.

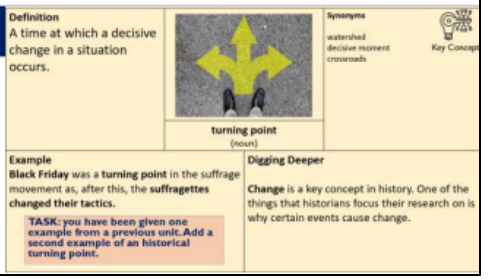
Pamela Rose

An actress recruited to Bletchley Park due to her ability to speak German. Along with many other women she carried out the day to day tasks that were requited for Britain's code breaking efforts to be successful.

Key question: What was Kristallnacht, and why was it a turning point in the treatment of the Jews in Nazi Germany?

Kristallnacht, also known as the Night of Broken Glass, was a night of violence against Jewish people across Germany. 300 were killed and 30,000 arrested, **synagogues** were attacked. Before this, Jews had been treated badly in Germany, for example laws had been passed that took away their rights, humiliated them and made it hard for them to earn a living, however after Kristallnacht antisemitic discrimination became much worse. Following Kristallnacht, violence against Jews became horrific, with Jews forced first into ghettos and then into extermination camps like Auschwitz where ultimately 6 million people would be murdered.

Historians see Kristallnacht as a **turning point** as there was a marked difference in the way that Jewish people were treated before and after this key event.



Y9 LC2 SB1 French festivals & culture : Quelle est ta fête préférée?

Opinion verb	Festival nouns	pronoun	present tense phrase	opinion		adjective
Ma fête préférée est (My favourite festival is) J'ai toujours aimé (I've always liked) Je n'ai jamais aimé (I've never liked)	le jour de Noël (Christmas Day) la fête Nationale (Bastille Day) le jour de l'an (New Year's Day) la fête des rois (Twelfth Night) la Saint Valentin (Valentine's Day) le 1er avril (April Fool's Day) Pâques (Easter) Diwali (Diwali) Eid (Eid/Ramadan) Hanoucca (Hanukkah)	pour célébrer on (to celebrate we) d'habitude on (usually we) 	s'offre des cadeaux (give presents) colle un poisson sur le dos (Stick a fish to the back) fait un défilé/un concert (have a parade/concert) regarde les feux d'artifice (watch the fireworks) envoie des cartes/fleurs (send cards/flowers) prend des photos (take photos) mange un repas spécial (eat a special meal) on mange du chocolat/un gâteau (we eat chocolate/a cake) on va à l'église/ à la mosquée/ à la synagogue/au temple (we go to church/mosque/ synagogue/temple)	selon moi c'est (according to me it's)	assez (quite) très (very) vraiment (really) trop (too) hyper (super)	inoubliable (unforgettable) romantique (romantic) animé (lively) traditionnel (traditional) joyeux (merry/happy) formidable (wonderful) amusant (fun) délcieux (delicious) nul (rubbish) barbant (boring)

Y9Fr LC2 SB2 : Describing family celebrations: Qu'est-ce que tu as fait pour fêter ton anniversaire ?

Time marker	past tense phrase	occasion	subject	auxiliary	tense	opinion tense	opinion phrase
		mon anniversaire (my birthday)					
Récemment (recently) Hier (yesterday) l'année dernière (last year) Il y a deux ans (two years ago)	j'ai célébré (I celbrated) j'ai fêté (I celebrated) on a célébré (we celebrated) on a fêté (we celebrated) 	l'anniversaire de (the birthday of) le mariage de (the marriage of) le PACS de (the civil partnership of) la naissance de (the birth of)	mon père/mon beau-père ma mère/ma belle-mère ma sœur/ma belle-sœur mon frère/mon beau-frère mon cousin ma cousine mon oncle ma tante mes grands-parents mon copain ma copine mon neveu ma nièce	j'ai (I) on a (we)	mangé un gâteau (ate a cake) fait la fête (had a party) donné des cadeaux (gave presents) reçu des cadeaux (received presents) lancé des confettis/fleurs (threw confetti/flowers) pris beaucoup de photos (took lots of photos) invité beaucoup de gens (invited lots of people porté des beaux vêtements (wore beautiful clothes)	c'était (it was)	inoubliable (unforgettable) romantique (romantic) amusant (fun) passionnant (exciting) joyeux (joyful) formidable (wonderful) fou (crazy) embêtant (annoying) fatigant (tiring)

Y9 Fr LC2 SB3: Daily routine : Que fais-tu normalement ?

Time marker	present tense reflexive	connective	time marker	tense	verb phrase	connective /verb	adjective
Avant d'aller au collège (before going to school) D'abord (Firstly) Le matin (In the morning) Pendant la semaine (during the week) D'habitude (Usually) 	je me lève tôt (I get up early) je me lave (I wash myself) je me brosse les cheveux (I brush my hair) je prends le petit déjeuner (I have breakfast) je bois un thé/café (I drink a tea/coffee) je lis mes messages (I read my messages) je fais mes devoirs (I do my homework) Je vais au collège (I go to school)	mais (but) cependant (however) pourtant (however)	pendant les grandes vacances (during the summer holidays) le weekend prochain (next weekend)	je vais (I'm going to)	me lever tard (get up late) me resposer (rest) rester au lit (stay in bed) rencontrer mes amis (meet my friends) faire du sport (do sport) regarder la télé (watch TV) écouter de la musique (listen to music)	car ce sera plus (because it will be more) car ce sera moins (because it will be less)	agréable (pleasant) amusant (fun) formidable (terrific) reposant (relaxing) intéressant (interesting) sociable (sociable) fatigant (tiring) stressant (stressful) barbant (boring)

Y9 Fr LC2 Sentence Builder 4: Illnesses : Tu étais malade ?

Time marker	Past tense	Connective	Time marker	Present tense	Past tense	Illness phrase
Hier (Yesterday) Lundi dernier (Last Monday) Mardi dernier (Last Tuesday) Le weekend dernier (Last weekend)	j'étais malade. (I was ill) j'ai eu un accident. (I had an accident))	Malheuresement (Unfortunately)	quand j'étais en train de (I was in the middle of)	faire du sport (doing sport) traverser la rue (crossing the road) étudier en classe (studying in class) regarder un film (watching a film) faire du ski/surf (doing skiing/surfing)	j'ai eu (I had) je me suis cassé (e) (I broke)	mal à la tête (a headache) mal au dos (a bad back) mal au cœur (I felt sick) le bras (my arm) le pied (my foot) la jambe (my leg)

donc (so) mais maintenant (but now) alors maintenant (so now)	je me sens mieux (I feel better) je suis fatigué(e) (I'm tired) je dois rester au lit (have to stay in bed) je dois aller à l'hôpital (have to go to the hospital) je prends des médicaments (I'm taking medecine) je vais chez le médecin (I'm going to the doctor) je dois me reposer (I have to rest)	

Year 9 Learning Cycle 2 Sentence Builder 1:

¿Por qué te llevas bien con...? = Why do you get on well with...?

Verb	Noun	Connective	Verb	Quantifiier	Adjective
Me encanta = I love Me gusta = I like Me llevo bien con... = I get on well with... Me peleo con... = I fight with... Me divierto con... = I have fun with...	mi pareja = my partner mi novio = my boyfriend mi novia = my girlfriend mi amig@ = my friend mi hermano = my brother mi hermana = my sister mi profesor de... = my ... teacher	porque = because	es = he/she is	demasiado= too tan= so muy= very bastante= quite un poco = a bit	alegre = cheerful ambicios@ = ambitious bonit@ = pretty/nice débil = weak enojad@ = angry fiel = faithful/ loyal gracios@ = funny nervios@ = nervous optimista = optimistic orgullos@ = proud perezos@ / vag@ = lazy sensible = sensitive tolerante = tolerant tont@ = silly
			Time phrase	**Verb phrase**	
			siempre = always nunca = never	me apoya = (he/she/it) support me me ayuda = (he/she/it) helps me me escucha = (he/she/it) listens to me me critica = (he/she/it) criticises me me acepta como soy =(he/she/it) accepts me as I am me hace reír/ llorar = (he/she/it) makes me laugh/ cry	
				tenemos mucho en común = we have lots in common	

un buen amig@ es alguien que = a good friend is someone who

te apoya = supports you
te ayuda = helps you
te escucha = listens to you
no te critica = doesn't criticise you
te conoce bien = knows you well

Year 9 Learning Cycle 2 Sentence Builder 2:

¿Quién es tu influencer preferido? = Who is your favourite influencer?

Verb	Connective		Verb	Adjective
Sigo a... = I follow...	porque = because aunque = even though	Creo que = I think that Diría que = I'd say that Para mí = in my opinion	es = he/she is era = he/she was será = he/she will be	artístic@ = artisitic bisexual = bisexual conocid@ por = known for especial = special famos@ = famous gay = gay gracios@ = funny heterosexual = heterosexual joven = young latin@ = Latin American musical = musical ric@ = rich solter@ = single transgénero = trangender únic@ = unique
			Verb	**Noun**
			lucha por = he/she fights for lucha contra = he/she fights against	el amor = love el arte = art el comportamiento = behaviour el conflicto = conflict la cultura = culture el deporte = sport la discriminación = discrimination las drogas = drugs la identidad = identity la imagen (de) = image (of) la industria = industry la política = politics las víctimas = victims

Year 9 Learning Cycle 2 Sentence Builder 3:

¿Quién es tu model a seguir? = Who is your role model?

Noun	Verb	Adjective	Connective	Verb	Noun
Mi modelo a seguir = my role model	es = he/she is era = he/she was	Carlitos Alcaráz Ibai Llanos Frida Kahlo Lin Manuel Miranda Rigoberta Menchú Rosalía alemán(a) = German argentin@ = Argentinian británic@ = British chin@ = Chinese chilen@ =Chilean colombian@ = Colombian cuban@ = Cuban español(a) = Spanish europe@ = European francés(a) = French inglés(a) = English italian@ = Italian lati@ = Latin American mexican@ = Mexican católico = Catholic cristian@ = Christian judí@ = Jewish musulmán(a) = Muslim religios@ = religious vegan@ = vegan vegetarian@ =vegetarian blanc@ = white negr@ = black	y	es = he/she is era = he/she was	un gran activista = a great activist un gran actor/actriz = a great actor/actress un gran autor = a great author un gran cantante = a great singer un gran carácter = a great character un gran compañer@ = a great colleague un gran cuidador(a) = a great carer un gran deportista = a great sports person un gran escritor = a great writer una gran estrella = a great star un gran influencer = a great influencer un gran jugador(a) de... = a great … player una gran mamá = a great mum un gran modelo = a great model un gran músic@ = a great musician un gran papá = a great dad un crack = a legend 

Year 9 Learning Cycle 2 Sentence Builder 4:

¿Qué son tus planes para el futuro? – What are your plans for the future?

Prep.	Verb	Adjective/ Noun	Auxiliary Verb	Verb
Para = (in order) to	ser = to be	famos@ = famous conocid@ = well known	voy a = I am going to vas a = you (s) are going to va a = he/she is going to vamos a = we are going to vais a = you (pl) are going to van a = they are going to	actuar en una obra = to act in a play bailar en un espectáculo = to dance in a show cantar en un concierto = to sing in a concert casarme con una estrella = to marry a star dirigir un película = to direct a film engañar a mucha gente= to trick lots of people fundar = to set up ganar un premio Nobel = to win a Nobel prize grabar un video = to record a video influir la moda = to influence fashion jugar a muchos deportes = to play lots of sports leer = to read pasarlo bien = to have a good time promover = to promote tener una voz = to have a voice tocar un instrumento = to play an instrument viajar por el mundo = to travel the world
	tener = to have	éxito = success respeto = respect		

MUSIC FOR SCREEN II

VOCABULARY

Score	*The original music composed specifically for a film, enhancing the emotional impact and storytelling.*
Soundtrack	*A collection of songs featured in a film, including both original scores and licensed tracks.*
Diegetic Sound	*Sound that originates from the world of the film, such as characters talking or music playing from a radio.*
Non-Diegetic Sound	*Sound that comes from outside the film's world, like background music that the characters cannot hear.*
Motif	*A short musical phrase associated with a character, theme, or idea in a film, often repeated throughout.*
Theme	*A memorable melody that represents a character or concept, frequently heard in different variations.*
Cues	*Specific moments in the score that correspond to events in the film, guiding the audience's emotions.*
Foley	*The process of creating sound effects, mimicking real-world sounds to enhance the viewers' experience.*
Ambience	*Background sounds that create a sense of place or environment in a film.*

LOGIC PRO SHORTCUTS

⌘ N	Create a new project
⌘ O	Open an existing project
⌘ S	Save current project
⌘ B	Bounce (export) current project
Space	Play/pause
Enter	Move playhead to beginning
,	Move playhead to the left
.	Move playhead to the right
⌘ C	Copy
⌘ V	Paste
⌘ Z	Undo
⌘ ,	Open preferences
⌘ ⌥ T	New track
A	Show/hide Automations
P	Show/hide Piano Roll view
X	Show/hide Mixer view
M	Mute track
S	Solo track
R	Start recording
C	Turn Cycle looping on/off
K	Turn metronome on/off
L	Turn Region looping on/off
Q	Quantize selected notes

MINIMALIST AND ALEATORIC MUSIC	
VOCABULARY	
Minimalism	*A style of music that uses simple, repetitive structures and limited musical materials to create complex soundscapes.*
Ostinato	*A short, repeated musical phrase.*
Drone	*A note or chord that is sustained for several bars.*
Cell	*A short section of music found in minimalist music*
Aleatoric Music	*A style of music that incorporates elements of chance and randomness in the composition or performance.*
Graphic Score	*A visual representation of music that uses symbols and drawings instead of traditional notation, allowing for flexible interpretation.*
Improvisation	*The spontaneous creation of music during performance, often a key component of aleatoric works.*
Controlled Chance	*A technique where composers set certain parameters for chance elements, balancing spontaneity with structure.*

KS3 Physical Education Head, Heart, Hands Assessment

Mastery	• I can **explain** a number of rules. I can **make links** between the strategies and tactics in different activities. • I am able to **apply** how key words on the knowledge organiser **relate** to different activities. • I am able to **analyse** performance to prioritise strengths and areas for development. I can communicate feedback and explain key coaching points.	• I am **hard working** and consistently give **100% effort.** I eagerly accept challenges and am a **role model** to others. • I am able to bring out the best in others to increase success when working as a team. • I demonstrate confidence and authority when officiating, leading and participating.	• I can **make links** between skills and techniques which will enable me to be successful across a range of sports and activities. • I can explain a problem to a team and communicate strategies to solve that problem. • Demonstrates **excellent fitness** across **all** activities.
Secure	• I can **explain** a number of rules. I can **apply** strategies and tactics in different activities. • I am able to **explain** all key words on the knowledge organiser • I am able to **analyse** performance and communicate strengths and areas for development.	• I am consistently on task and putting in my best effort • I am effective when working as a team and show respect to staff and equipment • I can demonstrate confidence to lead a group successfully	• I can apply appropriate skills and techniques to be successful within a competitive scenario • I can **identify a problem** and suggest solutions for pre-determined and spontaneous situations. • Demonstrates **very good fitness** across **a range** of activities.
Developing	• I can describe a limited number of rules, strategies and tactics • I am able to describe some key words on the knowledge organiser • I am able to **identify** strengths and areas for development and communicate **basic** feedback	• I am able to follow most instructions and am consistently on task • I am respectful when working as a team, to staff and equipment • I am developing my confidence and can demonstrate leadership qualities	• I am Developing the ability to apply skills and techniques within a competitive scenario • I can **identify a problem** and suggest solutions for pre-determined situations. • I can Demonstrate **good fitness** across **most** activities.
Emerging	• I can **identify** a limited number of rules, strategies and tactics. • I am able to **name** some key words on the knowledge organiser • I am able to **identify** strengths and areas for development.	• I am able to follow **simple instructions** and am developing the ability to stay on task • I am **developing** the ability to be respectful when working in a team • I am **developing** my confidence and understand the qualities that make a good leader	• The quality of **technique** is maintained for **few skills** and often deteriorates in challenging practises. • **Developing** problem solving skills but this may be ineffective for both pre-determined and spontaneous situations. • Fitness is a key area for development to become more effective within activities.
KS3 **Head | Heart | Hands** **Assessment**	**Head** **Knowledge | Understanding | Feedback Analysis | Rules | Strategies and Tactics**	**Heart** **Effort | Teamwork | Respect Leadership Resilience | Confidence**	**Hands** **Fitness | Physical Ability Technique Competition | Problem solving**

Year 9 Cycle 2 Sport and PE Knowledge Organiser

EDUCATION SOUTH WEST

PE

Week 1 and 2	Week 3 and 4	Week 5 and 6	Week 7 and 8	Week 9 and 10	Week 11 & 12
Training methods	**Training methods**	**Training methods**	**Principles of training**	**Principles of training**	**Training intensities**
Continuous training – steady-state low-moderate intensity with no rest breaks for a min of 20 minutes. Improves Cardiovascular endurance and muscular endurance. Fartlek training – a form of continuous training involving different intensities (speeds) and terrains (roads/fields, flat/hills). Improves cardiovascular endurance, muscular endurance and speed. Interval Training (also known as HIIT) – periods of exercise followed by periods of rest used by both aerobic and anaerobic performers. Improves speed, muscular endurance and cardiovascular endurance 	Circuit Training – a series of exercise stations arranged in a specific order to usually alternate muscle groups. Can also improve skill and develops a range of components of fitness.  Weight Training – a series of exercises organised into repetitions with an intensity and recovery time specific to the individual. Targets specific muscles. High reps/low weight improves muscular endurance Low reps/High weight improves strength/power 	Plyometrics – a series of explosive exercises (jumping, bounding) to improve the speed at which a muscle contract. Used by performers who sprint, jump or throw to improve power.  Static stretching– Stretch as far as you can and hold this (isometric contraction) for up to 30 seconds. Improves flexibility Can you identify which training methods are suitable for a range of sports/performers? e.g. continuous training for a long distance runner 	When planning a training programme, you need incorporate the basic principles of training. One of these principles is called the FITT principle. **The FITT Principle:** Each letter in the FITT is a different way in which you can adapt your training. Through **Frequency** *(how much)*, **Intensity** *(how hard)*, **Time** *(how long)* and **Type** *(what type)*. **F – FREQUENCY** – The number of training sessions you complete over a period of time. **I – INTENSITY** – How hard you train. This can be done through heart rate or reps per exercise. **T – TIME** – How long you train for. Aim for 15 to 60 mins. This can depend on the intensity of the exercise. **T – TYPE** – Appropriate types of training should be used depending on your needs and goals.	When planning a training programme, you need incorporate the basic principles of training. One of these principles is called the SPORT principle. **The SPORT Principle:** **S – SPECIFIC** - training must be **relevant** to the **individual** and their **sport.** **P – PROGRESSIVE** – This means the training needs to get harder over time. **O – OVERLOAD** – This can be used through the FITT principle. You can overload through frequency, intensity, time and type. **R – REVERSIBILTY** - systems **reverse** or de-adapt if training stops or is significantly reduced or injury prevents training from taking place. **T – TEDIUM** – Training needs to be varied to stop boredom from taking place.	To maximise the chance of improving your fitness you should train within your target zones. **Your 'Aerobic Training zone' is 60 – 80% of your MHR** **Your 'Anaerobic Training Zone' is 80 – 90% of your Maximal Heart Rate** (MHR) To calculate your MHR (maximum heart rate) you need to: 220 – Age = Try working out your MHR and what your heart rate needs to be to work in the two zones above (to work out 60% times your MHR by 0.6) 

My PE Targets

Cycle 1	Knowledge Organiser score:	Emerging	Developing	Secure	Mastery
My Target:					
Cycle 2	**Knowledge Organiser score:**	**Emerging**	**Developing**	**Secure**	**Mastery**
My Target:					
Cycle 3	**Knowledge Organiser score:**	**Emerging**	**Developing**	**Secure**	**Mastery**
My Target					

How to make a SMART target in PE

- Read the assessment band that you have been awarded
- Self-assess the most important area for you to develop out of Head, Heart and Hands
- Choose one bullet point from the band above that you are going to try and focus on in the next cycle

Examples of Targets

- This cycle I am going to try and work with different students in my group
- To demonstrate respect to others I am going to focus on listening when they are talking
- To show resilience even when practices get more challenging
- To improve my cardiovascular fitness by attending fitness suite club
- To improve my skill level by attending Badminton club

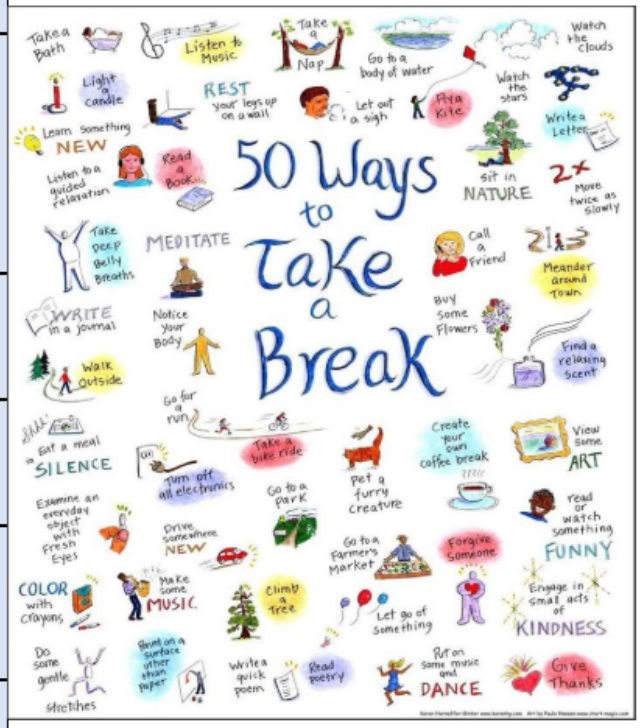
PSHE: How can I look after my well- being?

Key terms:

Mental health 	**Mental health** is about how we think, feel, and cope with life. Everyone has mental health, just like we all have physical health. Our mental health can change from day to day, or over time, depending on what's happening in our lives.
Good mental health 	Having good **emotional** and **mental** health is when we are in control of our thoughts, feelings, and behaviour. We are able to cope with life's challenges and we mostly feel good about ourselves and have good relationships with others.
Mental 	Relating to the mind
Physical 	Relating to the body as opposed to the mind.
Emotions 	These are also called **feelings.** They can be affected by situations and our relationships with others
Healthy coping strategy	Good things we can do to help us to manage our most intense, thoughts and emotions.

Take a break: do something you enjoy

Try to plan some activities that you enjoy and which will take your mind off things, whether that's texting or face-timing a friend, watching a film, reading a book or going for a walk.



PSHE: How we can we look after our well-being?

Further support

At school:
Inclusion Team
PSHE teacher
Tutor
MHA
Safeguarding Lead Ms Ray

There are lots of places to get advice about emotional wellbeing, social media or to discuss feelings.

ChildLine:
www.childline.org.uk Phone: 0800 1111

Young Minds:
www.youngminds.org.uk

Samaritans:
www.samaritans.org Phone: 116 123

In a crisis, text 'Shout' 85258 here for you 24/7

'10 a day' choices towards balancing our mental health

5 minute mental wellbeing actions

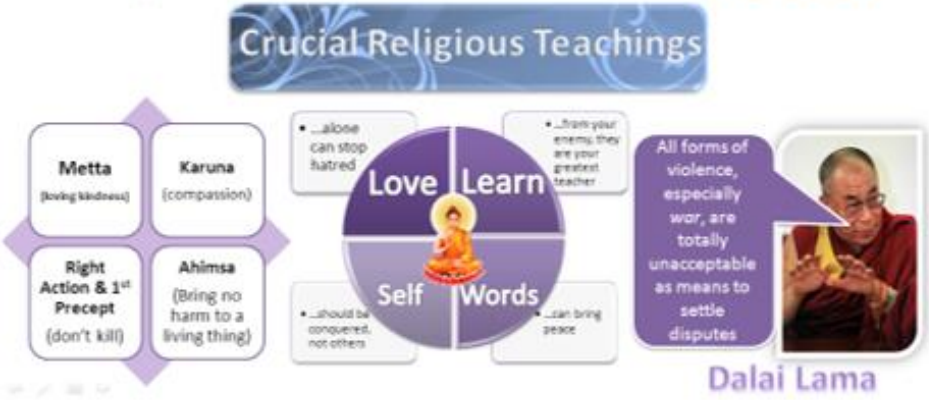
These are simple, free actions you can do daily.
Many take very little time or energy, and most can be done in less than five minutes.

- **Breathe – take a few deep breaths**
- **Have a glass of water**
- **Have a healthy snack**
- **Do a 5 minute burst of exercise**
- **Connect with someone you care about – give them a hug, send them a message**
- **Take a moment to be still and present**


Words to use in your answers...
Peace
Justice
Sanctity of Life
Causes of War
WAR
Effects of war...
Death
Maiming
Refugees
Key Facts


Hutu and Tutsi civil war
One million killed & more maimed
Example of a recent war
RWANDAN CIVIL WAR 1994


Love thy neighbour
Thou shalt not kill
Agape
Good Samaritan
Love
Forgive
Pray
Live
No more war! Never again war! If you wish to be brothers, drop your weapons.
Pope Paul VI


Crucial Religious Teachings
Metta
(loving kindness)
Karuna
(compassion)
Right Action & 1st Precept
(don't kill)
Ahimsa
(Bring no harm to a living thing)
Love
Learn
Self
Words
All forms of violence, especially war, are totally unacceptable as means to settle disputes
Dalai Lama


Just War
Holy War
Righteous Anger
Liberation Theology


To fight or not fight?


Pacifism
Peace
Non-Violent Protest
Sanctity of Life


RED CROSS
Hospitals
Promoting peace
Refugee camps
Shelter
Food
United Nations
UN


Issues, Organisations & People
Nuclear Proliferation
For
Against
Against Christian teachings
Against Buddhist teachings
Tiny handful of extremists
Dalai Lama

Ergonomics

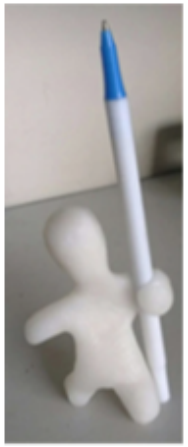
Ergonomics is the science of **designing products so they are comfortable for people to use and interact with**. It's all about making sure that anything we physically interact with fit the person using them as well as possible.

EXAMPLE – An ergonomically design tool handle is shaped to the contours of your hand, so that it is easy and comfortable to grip.

EXAMPLE – An ergonomically design chair supports your back and helps you sit properly, so you don't get sore after sitting for a long time.

Polymorph

Polymorph is a **thermoforming plastic that softens at 62°.** It is easy to bend and form but cools hard to mimic a plastic product. It is very effective for creating 3D models of products, which you can then test for e.g. how ergonomic they are.



Inclusive design

Inclusive design means creating things (like buildings, websites, or products) so that **everyone can use them easily, no matter their age, ability, or background**. It's about designers thinking ahead to include people who might have disabilities or other challenges, so no one feels left out.

EXAMPLE – An inclusively designed playground has ramps and swings for kids who use wheelchairs.

EXAMPLE – An inclusively designed website that lets you change the text size or colours to help people with vision issues read it.

Inclusive design helps make the world fairer and easier for everyone to enjoy and interact with. Products that are design inclusively can lead to products that are easier to use by everyone:

EXAMPLE – A single lever tap does not require you to grip or twist it in order to turn it on or adjust the temperature. This means a simple push with your hand, elbow or even chin will enable you to operate it.

Empathetic Design

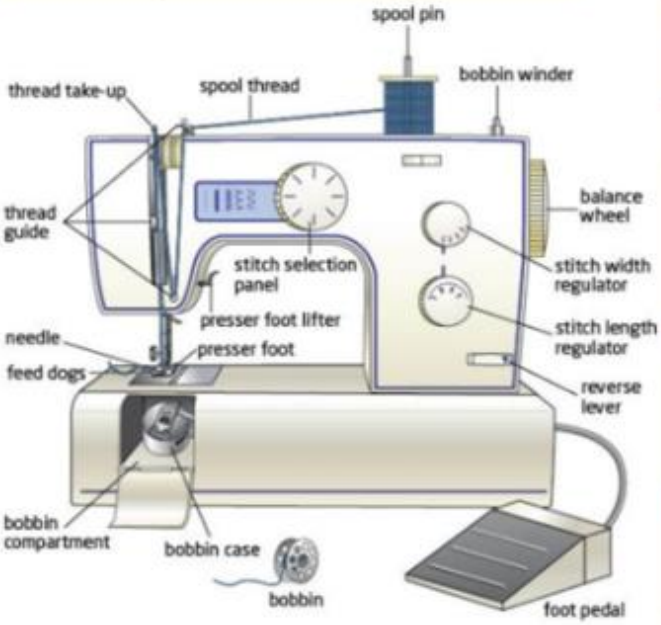
Empathy means understanding and sharing how someone else feels, like imagining what it's like to be in their situation. Therefore, **empathetic design** means putting yourself in someone else's shoes before you create something, so it helps solve their problems or makes their life easier.

Designers will **talk to and observe people** using current products or going about the daily lives, to understand as best they can the issues, struggles and difficulties people have.

However, to help them experience first-hand the difficulties people may have, designers can use **specialist tools that help simulate certain conditions or stages of life.**

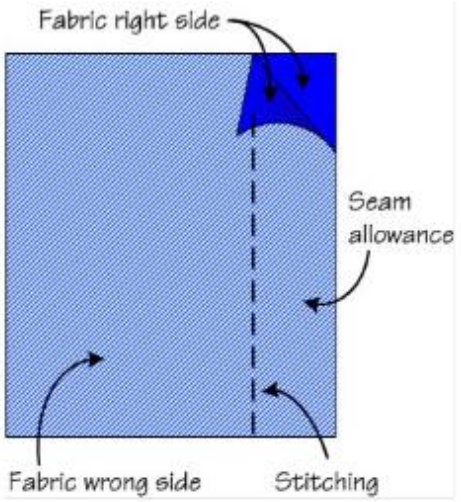
EXAMPLE – Gloves that help simulate the reduction of hand movement associated with arthritis.

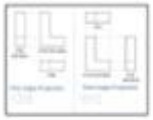
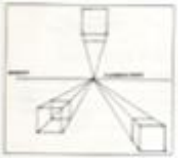
Anatomy of a Sewing Machine

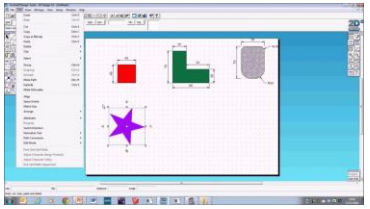


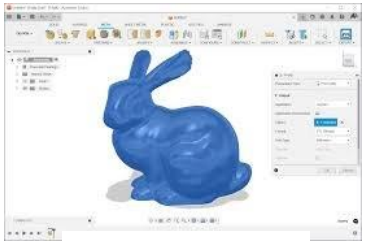
How to thread a Sewing Machine

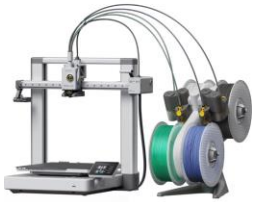
TEXTILES KEYWORDS	DEFINITION
Thread Tension	The amount of thread that can pass through the machine to create the stitch
Stitch Length	The length of one stitch
Spool	A reel on which thread is wound round, which sits on top of the machine. It assists the lower thread by making stitches on the top side of the fabric.
Bobbin	A reel on which thread is wound round, which sits under the needle. It assists the upper thread by making stitches on the bottom side of the fabric.
Presser Foot	an attachment used with sewing machines to hold fabric flat as it is fed through the machine and stitched
Reverse Lever	When pressed, the machine can sew backwards. A back stitch is used to secure the thread at the end of a point or corner.
Balance Wheel	Allows you to move the needle up and down. Useful for threading the needle.
Fabric Interfacing	Interfacing is a textile used on the unseen or "wrong" side of fabrics to make an area of a garment more rigid.
Seam Allowance	The area between the fabric edge and the line of stitches. Doing this ensures that you cut out all of the pattern pieces large enough so that when they are stitched together they fit perfectly.

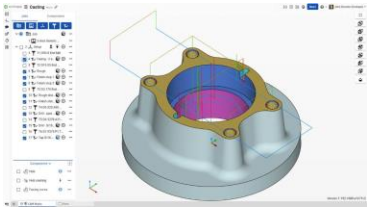


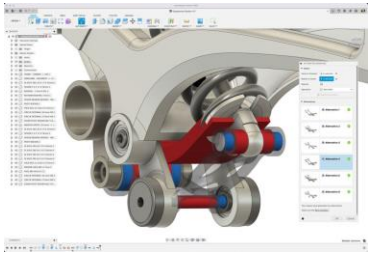
Communication techniques.		Examples
What is an orthographic drawing?	Orthographic projection is used to show detail and measurements of the product clearly from a range of angles so that a stranger could use the drawing to work out the shape and dimensions for manufacture. A furniture designer would be a perfect example of someone who may use orthographic projection. To create an orthographic projection, you draw the front view, side view and plan view of your product in 2D. You can either draw them out by hand or generate the views using various CAD programs.	
What is an exploded view?	Are an effective way of demonstrating what is inside a product. These enable designers to think about the materials, the components and the way that the product is assembled. Exploded views show how the product would look if it were to be disassembled. You often find exploded views in the drawings that make up a patent.	
What is an assembly drawing?	These are used by designers to inform manufacturers and customers about how to assemble a product correctly. IKEA uses assembly drawings in their instructions for flat-pack furniture. The drawings show how parts fit together, which components go where. Parts are often numbered and named with dimensioned detail drawings.	
What perspective drawing?	Perspective drawings tend to look more realistic than both oblique and isometric techniques, as they visualise objects in a very similar way to our eyes. There are two types of perspective drawing: one-point perspective and two point perspective.	
What is 1 point perspective drawing?	One point perspective is a drawing method that shows how things appear to get smaller as they get further away, converging towards a single 'vanishing point' on the horizon line. It is a way of drawing objects upon a flat piece of paper (or other drawing surface) so that they look three-dimensional and realistic.	
What is 2 point perspective drawing?	Two-point perspective - This shows an object from the side with two vanishing points. It gives the most realistic view of a product as it shows the item edge on, as we would see it. It is often used to produce realistic drawings of an object.	

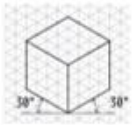










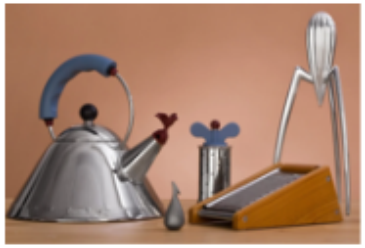
Communication techniques.		Examples
What is Freehand sketching?	Often used by designers in the generation of their initial ideas. Freehand sketching is an effective way of quickly getting your ideas either in 2D or 3D from your head onto paper. Further along the process, the freehand sketches can be developed in more depth often with a different technique.	
What is isometric drawing?	Isometric drawing Isometric drawing is way of presenting designs or drawings of a 3D object. They are used by architects and engineers to communicate their ideas to the client and manufacturer, showing the product or design to scale. **In order for a design to appear three dimensional, a 30 degree angle is applied to its sides.**	
What is oblique drawing?	**Oblique projection** is a simple type of technical drawing of graphical projection used for producing two-dimensional (2D) images of three-dimensional (3D) objects. The objects are not in perspective and so do not correspond to any view of an object that can be obtained in practice, but the technique yields somewhat convincing and useful. Oblique projection is commonly used in technical drawing. **In order for a design to appear three dimensional, a 45 degree angle is applied to its sides.**	

The use of computer aided design and computer aided manufacture.	
What is CAD?	Computer aided design (CAD) is the use of computer software to design new products in 3D. This enables businesses to visualise new designs in a variety of materials and send images around the world for collaboration and consultation. Once production is finalised, these designs are sent to computer aided manufacture (CAM) machines to be formed.
What is CAM?	Computer aided manufacture (CAM) involves using computers to control machines to undertake the production of goods. By using CAM, designs can be sent to CAM machines such as **laser cutters, 3D printers and milling machines.**
What are the advantages of CAD?	• Ideas can be drawn and developed quickly • Designs can be viewed from all angles and with a range of materials • Some testing and consumer feedback can be done before costly production takes place • It becomes easier to design and test a range of ideas
What are the disadvantages of CAD?	• Expensive to set up • Difficult to keep up with constantly changing and improving technology • Computers can fail
What CAD programmes do we use in school?	2D Design and Autodesk fusion 360

Who is Alessi?

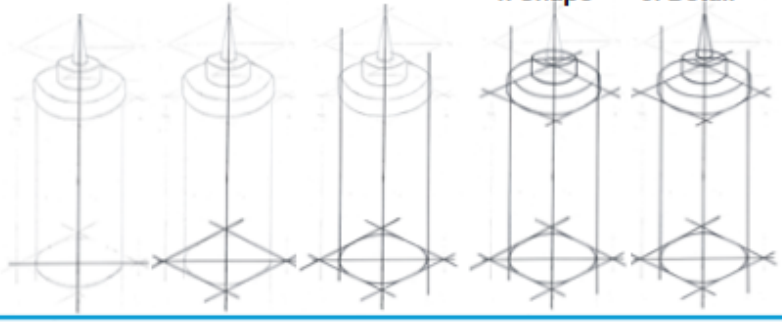
Founded in 1921, Italian brand Alessi is committed to making the ordinary extraordinary. Known for elevating everyday objects from fruit bowls to corkscrews, their designs are instantly recognisable.

From what started as a metalwork factory, Alessi is infamously known for their innovative homeware designs. Designers and architects around the world take everyday objects and turn them into a hybrid of functional art.

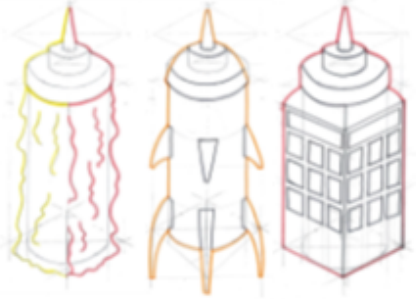


3D Illustration Stepped Support

Consider the basic 3D forms (shapes) of your object, then break it down into individual shapes using guidelines for accuracy. Example: Use the guideline progression steps below to sketch the basic outline.



Example Product Design Outcomes



Keywords:

Hybridization

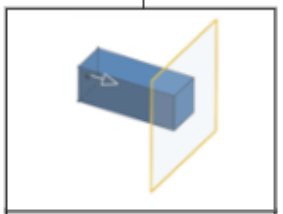
Definition
What is the meaning?
*The combination of **art** and **functionality** to create an innovative product*

Word Family
Words with a similar meaning
- *Combination*
- *Remix*
- *Fusion*
- *Blend*
- *Mixture*

Examples
Products with this design approach
Alessi Products:
- *Bunny & Carrot paper towel holder*
- *Caricature bottle openers*
- *Boat butter dish*
- *Magic bunny toothpick*

Digging Deeper
Why is hybridisation used in design?
To give products a unique selling point.

Extrude



Definition
What is the meaning?
The process of stretching a flat, 2D shape vertically to create a 3D shape

Word Family
Words with a similar meaning
- *Force out*
- *Eject*
- *Release*
- *Express*

Examples
Name a 3D design computer software
- *Fusion 360*
- *OnShape*
- *Sketchup*
- *Autodesk*

Digging Deeper
Why is 3D computer design used within product development?
Designers can view and edit the design easily prior to physical prototyping, which can save time and money.

Knowledge Organiser

100 °C Boiling Water
bacteria will be destroyed

75 °C Cooking/Reheating

63 °C Minimum Hot Holding

37 °C Body Temperature
ideal temperature for bacteria to grow

8 °C Food Storage
store food at this temperature or below

5 °C Fridge Temperature

-18 °C Freezer Temperature
bacteria won't grow but may not die

All the above temperatures are guidelines only

The concept of food miles also includes the waste generated from the product, which must be transported from a home to a landfill site. The average household throws away more than three kilograms of food and 14 kilograms of food packaging per week. Buying food with as little packaging as possible and composting organic waste can also make a difference.

Pathogenic bacterium	Where it is found	Typical symptoms	Average onset time
Campylobacter	Raw poultry, meat, milk, sewage	Abdominal pain, diarrhoea (bloody), nausea, fever	48-60 hours
Salmonella	Intestines of humans and animals Raw poultry and meat eggs, milk	Abdominal pain, diarrhoea, nausea, vomiting	12-36 hours
Staphylococcus A	Humans – skin, hair, nose, mouth, throat, cuts, spots	Abdominal pain/cramps, vomiting, chills	1-6 hours
E. coli 0157	Human and animal sewage, water, raw meat, muddy vegetables	Abdominal pain, fever, diarrhoea, vomiting, kidney damage/failure	12-24 hours

Food miles

Food miles are the distance that food travels from field to plate. The means of transport, as well as the distance, is an important consideration when choosing which foods to buy. For example a longer journey by boat has less environmental impact than a shorter one by road.

Carbon footprint

Food miles also lead us to consider the **carbon footprint** of a product. This involves looking at the entire production chain, including all the processes involved in the product's creation and transportation, to calculate the total emissions of carbon dioxide and other greenhouse gases that it is responsible for.

If we choose to buy products that are grown and produced in the UK, it is possible to reduce the amount of unnecessary food miles. However this is not always the case; reports show that even though it reduces food miles, it is less environmentally friendly to grow tomatoes in the UK under glass than it is to import tomatoes from Spain. The reason for this is that Spain's warm climate does not require heated glass houses, meaning the energy used in transporting tomatoes from Spain is less than the energy it would take to heat glass houses for growing tomatoes in the UK.

Ways to reduce food waste

There are many ways that consumers can minimise the amount of food waste they produce.

- Plan your food shopping - this helps to avoid buying food already in the house, or being tempted to buy too much.
- Store food in the correct place at the correct temperature – a cool cupboard, the fridge or the freezer – to avoid it going off prematurely.
- Be waste-free by using up leftovers, for example in soups and smoothies.
- Understand the difference between 'use-by' and 'best before' dates. Food that is eaten after the 'best before' date will not be of such good quality but will not be harmful to eat.
- Compost food that cannot be eaten such as vegetable peelings and teabags.

Cross-contamination

Bacteria have neither wings nor legs and cannot move from one food or surface to another. They need a 'vehicle' for this which is usually a human, insect or animal. For example, if someone uses the same knife to cut raw chicken then without washing it cuts cheese for a sandwich, the pathogenic bacteria will be transferred from the raw chicken to the cheese. This is called **cross-contamination**.

How to prevent cross-contamination

There are a number of precautions that need to be observed to prevent cross-contamination of food.

A pest infestation must be dealt with immediately.

Even domestic animals present a risk. Pets such as cats and dogs can bring pathogenic bacteria into the home, so always wash your hands after touching your pet.

To reproduce, bacteria need to be given ideal conditions which are ⟶

Given ideal conditions, bacteria will reproduce through **binary fission** where one bacterium splits into two bacteria, two into four, four into eight and so on every 10 to 20 minutes. Binary fission will happen more quickly in warm foods and high risk foods left in a warm area. Some bacteria, classed as **anaerobic** bacteria, are able to reproduce without the presence of oxygen.

LACTOSE INTOLERANCE

Lactose intolerance means that the person must avoid cow milk. This can be replaced with other milks such as hazel, hemp, almond, rice or soya milk. Lactose-free products such as cheese are also available.

People with lactose intolerance cannot digest the milk sugar, lactose, because of an enzyme deficiency in the body. The body digests lactose using a substance called lactase to break down lactose into two sugars called glucose and galactose which can then be easily absorbed into the bloodstream. People with lactose intolerance do not produce enough lactase, so lactose stays in the digestive system where it is fermented by bacteria, leading to the production of various gases, causing the symptoms associated with lactose intolerance.

Many processed foods contain lactose. Lactose intolerant people should read the labels to check.

COELIAC DISEASE

Coeliac disease is triggered by gluten (a collective term for protein found in cereals, wheat, rye and barley) and causes the body's immune system to attack its own tissues.

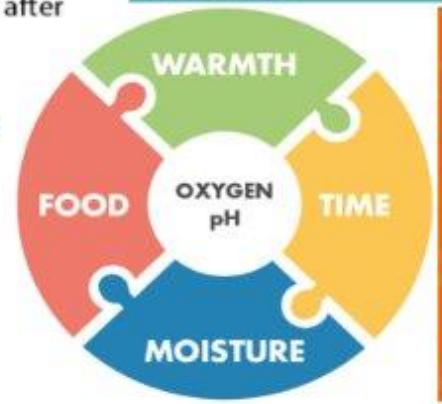
Foods that are naturally gluten-free such as rice, corn, maize, potato, buckwheat, polenta, soya and millet can be made into flours which can be used in gluten-free dishes.

All types of plain meat, fish, eggs, cheese, milk, most yoghurts, fruits, vegetables and pulses (peas, beans and lentils) are also naturally gluten-free and can be eaten freely on a gluten-free diet.

Foods such as bread, biscuits, cakes, couscous and pastas must be avoided.

Gluten can also be found in custard powders, thickening starch, some cheese spreads and sauces.

Gluten-free products are widely available and their packaging carries a special symbol.



REASON FOR COOKING

- To kill **pathogenic bacteria** and toxins making the food safe to eat
- To soften the food making it easier to chew and swallow
- To make the food more digestible
- It improves and intensifies the flavour of food
- The food looks more attractive and appealing
- It reduces the 'bulk' of the food
- Provides variety to our meals
- To enable certain ingredients to work together
- We eat hot food to keep warm in cold weather

Geography Answer Sheet

Geography Knowledge Organiser Answer Sheet

Lesson 1 1 2 3 4 5	Lesson 2 1 2 3 4 5	Lesson 3 1 2 3 4 5	Lesson 4 1 2 3 4 5
Lesson 5 1 2 3 4 5	Lesson 6 1 2 3 4 5	Lesson 7 1 2 3 4 5	Lesson 8 1 2 3 4 5
Lesson 9 1 2 3 4 5	Lesson 10 1 2 3 4 5	Lesson 11 1 2 3 4 5	Lesson 12 1 2 3 4 5
Lesson 13 1 2 3 4 5	Lesson 14 1 2 3 4 5	Lesson 15 1 2 3 4 5	Lesson 16 1 2 3 4 5
Lesson 17 1 2 3 4 5	Lesson 18 1 2 3 4 5	Lesson 19 1 2 3 4 5	Lesson 20 1 2 3 4 5
Lesson 21 1 2 3 4 5	Lesson 22 1 2 3 4 5	Lesson 23 1 2 3 4 5	