Year 9
Learning Cycle 1

Student Name:_____

Contents

How to Use your Learning Cycle Planner

Poltair School believe that the Learning Cycle Planner should be used daily for classwork and home learning. The Learning Cycle Planner will inform students and parents of topics that are being covered in class during each learning cycle, enabling all students to extend their learning outside of the classroom.

Students should be using their Learning Cycle Planner as a revision guide for assessments and using their SORT strategies to revise for each subject prior to assessments.

Learning Cycle 1 Knowledge check dates

27/11/23 - 8/12/23

At Poltair we SORT it!

What are the SORT strategies?

The aim is for all students to be fully prepared and ready for all assessments in all subjects.

To help them with this we have a whole school revision/study strategy – SORT.

There are three learning cycles throughout the academic year. At the beginning of each learning cycle students will be issued with a learning cycle planner which details all the knowledge they are expected to know and recall by the end of the learning cycle.

Each day, for home learning, students are set two activities that support in memorising and recalling this core knowledge.

Summarise	**Organise**	**Recall**	**Test**
Summarise and condense any class notes, revision guides and revision.	Organise your revision materials by topic/subtopic. Traffic light your PLC sheets to identify areas of weakness or gaps (Red/Amber) that need to be prioritised.	Use active recall and spaced repetition to memorise your knowledge organisers until you can recall the information eg. Look, cover, write or self-testing	Use low stakes online tests/quizzes and answer high stakes past paper/sample questions to check and apply knowledge and understanding
Strategies			
• Cornell Notes • Flash cards • Mind mapping • Revision clocks • Dual coding	• How to use your PLC • How to schedule your home learning and stick to it!	• Look cover & test • Leitner system • Blurt it • Transform it	• Low stakes • Self-quizzing • Quiz each other • Online quizzes • High stakes • Exam style questions

ATTENDANCE FOCUS

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ATTENDANCE FOCUS

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Attendance Reflection Sheet	
What is your current attendance?	
How many sessions have you missed of school?	
How many 'I' coded sessions have you had?	
How many 'M' coded sessions have you had?	
How many 'L' coded sessions have you had?	
How many 'U' coded sessions have you had?	
How many 'O' coded sessions have you had?	
How many days does this equate to so far this year?	
If this attendance contimued how many days off would you have this year?	

To improve my attendance, I commit to the following:	
1.	
2.	
3.	
What attendance do you want to end this term with?	
What is your end of year attendance target?	
What is our minimum expected attendance to be rewarded?	

Possible strategies to REACH MY attendance Goals

- I will make attending school every day a priority.
- I will keep track of my attendance and absences.
- I will set my alarm clock for _____a.m.
- I will attend school everyday unless I am truly sick.
- I will find a relative, friend or neighbour who can take me to school if I miss the bus.
- If I am absent, I will contact my teachers to find out what I missed.
- I will set up medical and dental appointments for weekdays after school. If I must make a medical appointment during the school day, I will try to attend school for most of the day.
- When I am struggling with a challenge that is keeping me from school I will confide in an adult at school and seek help.

Home Learning timetable - when I am going to complete my home learning

	Mon A	Tue A	Wed A	Thu A	Fri A
Core Activity	1 hour of reading for pleasure 1 hour of SPARX Maths XP and target practice				
Subject 1	Maths	English	History	Science	Geography
Subject 2	DT	Food	Drama	Spanish	Music
	Mon B	**Tue B**	**Wed B**	**Thu B**	**Fri B**
Core Activity	1 hour of reading for pleasure 1 hour of SPARX Maths XP and target practice				
Subject 1	1 hour of SPARX Maths XP and target practice	English	History	Science	Geography
Subject 2	Computing	Art	RE	Spanish	

Expected time home learning will take:

Activity	Time
Reading	30 mins
Sparx Maths	30 mins a goal
All other activities	15 mins each

My Computer passwords:

Platform	Username	Password
School System		
Sparx Maths		
Educake		
Memrise		

Revision Planner

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Time	Saturday	Sunday
8.30am - 4pm						8.30am - 4pm		
4pm - 5pm						4pm - 5pm		
5pm - 6pm						5pm - 6pm		
6pm - 7pm						6pm - 7pm		
7pm - 8pm						7pm - 8pm		
8pm - 9pm						8pm - 9pm		

Year 9 Learning Cycle 1 Personal Learning Checklists

English

Key Ideas	S	O	R	T
Understanding the meaning of rhetoric				
Identifying and analysing rhetorical methods				
Identifying and analysing pathos, ethos and logos				
Planning a well-sequenced extended persuasive speech				
Using a range of effective language methods to support my persuasive purpose				
Using a range of effective structural methods to support my persuasive purpose				
Using a range of sophisticated vocabulary precisely to convey an opinion				
Using a range of punctuation accurately in an extended piece of writing				
Using a range of verbal and non-verbal features to deliver a speech to an audience				

English

Key Ideas	S	O	R	T
Recalling significant moments in the plot				
Understanding characters and how they develop throughout the play				
Understanding key themes (power, tyranny, rebellion, oppression, corruption, conflict)				
Identifying and analysing language methods used by Orwell				
Identifying and analysing cyclical structure				
Understanding Orwell's intentions and messages				
Understanding how the historical context of the Russian Revolution influenced the plot and characters of the novella				
Understanding Priestley's intentions and messages				
Planning thoughtfully sequenced responses to exam questions				
Writing thesis introductions				
Developed what, how, why paragraphs				
Using a range of references (including quotations) to support ideas				
Using appropriate connectives				
Developing analysis with relevant contextual ideas				
Using a range of sophisticated vocabulary to enhance analysis				
Understanding the conventions of a polemical article				
Using knowledge of the novella to write an extended polemical article				

English

Key Ideas	S	O	R	T
I can draw and interpret bar charts, vertical line charts, pie charts and frequency polygons				
I can use a protractor to draw and measure angles				
I can expand and factorise single brackets				
I can substitute numbers into algebraic expressions				
I can solve a and 2 step equations				
I can solve equations where the variable is on the denominator				
I can solve equations involving brackets				
I can solve equations with variables on both sides				

Year 9 Learning Cycle 1 Personal Learning Checklists

Maths

Key Ideas	S	O	R	T
I can write a number as a product of its prime factors				
I can find the HCF and LCM of a number from the product of its prime factors				
I can substitute into expressions				
I can expand and factorise single brackets				
I can expand double brackets, including repeated brackets				
I can interpret and draw two-way tables and frequency trees				
I can find averages from a list				
I can find averages from a table				
I can compare data using averages				
I can find the area and perimeter or rectangles, triangles, parallelograms and Trapeziums				
I can find the area and perimeter or rectangles, triangles, parallelograms and Trapeziums				

Maths

Key Ideas	S	O	R	T
I can form and simplify ratios				
I can write ratios in the form 1:n and n:1				
I can write ratios and fractions and fractions as ratios				
I can write equations as ratios and ratios as equations (higher only)				
I can convert numbers in and out of Standard Form				
I can use basic index laws				
I can evaluate numbers using negative and fractional indices				

Science

Key Ideas	S	O	R	T
I can identify the structure found in eukaryotic and prokaryotic cells				
I can describe the differences between animal and plant cells				
I can calculate magnification, actual size and image by rearranging formulae				
I can describe and explain how substances move in and out of cells				
I can describe the process of cell division by mitosis				
I can evaluate the use of stem cells in medicine				
I can describe the symptoms and treatment for a range of bacterial, viral, fungal and protist diseases				
I can explain how the body defends against disease				
I can explain how vaccinations work to prevent disease				
I can evaluate the process of drug development				

Year 9 Learning Cycle 1 Personal Learning Checklists

Science

Key Ideas	S	O	R	T
I can select the best way to separate a mixture and explain how distillation and filtration work				
I can recall the structure of an atom and correctly label a diagram of an atom from memory				
I can describe the history of the atom including key scientists and what they discovered				
I can draw the electronic configuration for the first 20 elements correctly using electron shells				
I can describe what happens when a metal and non-metal form an ionic bond				
I can describe what happens when non-metals form covalent bonds				
I can describe what the reactivity series is				
I can use the reactivity series to explain displacement and extraction of metals from their ores				
I can describe the environmental impacts of mining for metals and justify why metals should be recycled				

Geography

Key Ideas	S	O	R	T
Define key terms – standard of living and quality of life				
Describe the factors that lead to differences in wealth				
Describe the distribution of global wealth				
Explain reasons for global differences in wealth				
Define key development indicators				
Explain the link between GDP and life expectancy				
Define and evaluate the Human Development Index				
Explain the causes of uneven development				
Explain how we can reduce the development gap				

Geography

Key Ideas	S	O	R	T
Name and locate the layers of the earth				
Name and locate tectonic plates on a world map				
Explain the process of mantle currents				
Explain the processes operating at destructive plate boundaries				
Explain the processes operating at constructive plate boundaries				
Explain the processes operating at conservative plate boundaries				
Explain the primary and secondary effects of tectonic hazards				
Explain the benefits of living in a hazardous area				
Explain the causes and effects of tsunamis				
Explain how planning, prediction and protection can reduce impacts of tectonic hazards				

Year 9 Learning Cycle 1 Personal Learning Checklists

History

Key Ideas	S	O	R	T
I can outline reasons for the boom in America in the 1920s				
I can explain why some groups did not benefit from the boom				
I can outline the reasons for the Wall Street Crash				
I can define what is meant by Nature, Origin and Purpose				
I can define important key terms related to the Holocaust				
I can create a timeline showing how the persecution of Jewish people developed between 1933-38				

Spanish

Key Ideas	S	O	R	T
I understand the rules for correct Spanish pronunciation				
I understand the meaning of all of the question words				
I know my non-negotiable verbs for the past, present and future tenses				
I can confidently introduce myself in Spanish				
I can confidently talk about the people in my family				
I can describe the relationships with my family				
I can describe the relationships with my friends				

Computing

Key Ideas	S	O	R	T
I know that Python is a high-level coding language				
I can explain how selection can be used to make decisions in the code				
I know that iteration means the part of the code that repeats.				
Two examples of iteration are While loops and For loops				
I know that Sequence is when one part of the code follows the next.				
I can identify variables, strings and lists in Python code				
I can explain what a network is and how this relates to the Internet				
I can define what WAN, LAN and PAN networks are and when they are used				

Year 9 Learning Cycle 1 Personal Learning Checklists

Computing

Key Ideas	S	O	R	T
I can recognise HTML key words				
I can edit HTML to change format and design of a webpage				
I know the difference between the WWW and the internet				
I can create and use CSS statements				
I know the factors that affect the file size of an image				
I know the factors that affect the file size of a sound file				
I can explain how images are stored using binary				
I can explain how images are stored using binary				

Art

Key Ideas	S	O	R	T
I can understand and explain the meaning of the 7 observational drawing key words, tone, texture, shape, scale, line and composition				
I can discuss and compare the different viewpoints of WW1				
I can empathise with the people affected by WW1				
I understand how to research and select information to develop ideas				
I understand how to develop my ideas using the work of WW1 artists, poets and people to design and create a final outcome				
I understand how to use my chosen materials with skill and flair				

DT

Key Ideas	S	O	R	T
I am able to construct a box to a specification.				
I can design a way of securing the contents of your box.				
I can use tools safely and with precision.				
I can ensure that your security box is aesthetically pleasing (looks good).				
I can use creative ideas in your design.				

Year 9 Learning Cycle 1 Personal Learning Checklists

Food

Key Ideas	S	O	R	T
I can explain how to ensure a hygienic and safe kitchen environment.				
I understand the importance of a balanced diet.				
I can explain the difference between macronutrients and micronutrients.				
I know the source, function and deficiency of the five main nutrients.				
I can describe the dietary needs of a teenager.				
I can describe the process of gelatinisation				

RE

Key Ideas	S	O	R	T
I can explain the difference between Absolute and Relative Morality				
I can define Omnipotence, Omnibenevolence and Omniscience				
I can give an overview of the Story of Job and Story of the Fall				
I can explain what the main themes of the Story of Job and the Story of the Fall are				
I can outline the key ideas of Epicurus about the problem of evil				
I can outline the 4 Noble Truths in Buddhism				
I can explain what the purpose of the Eightfold Noble Path is				

Music

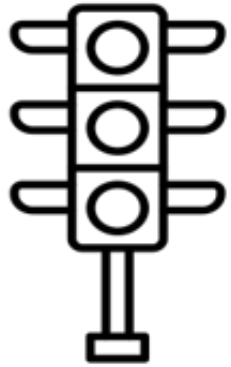
Key Ideas	S	O	R	T
I can find notes on a keyboard				
I can form triad chords without guidance				
I am able to understand how to read music notes from a stave				
I understand how to how to recognise syncopated rhythms				
I know how to identify consonance and dissonance				
I am able to perform accurately and in time as a group				
I understand the cultural and societal history of Reggae				

Year 9 Learning Cycle 1 Personal Learning Checklists

Drama

Key Ideas	S	O	R	T
I can use effective physical and vocal skills to interpret my characters				
I have ensured that effective characterisation has been explored through rehearsal				
I can make sure that all lines have been learned and memorised accurately				
I can make sure that all members of the group have worked collaboratively and effectively				

At Poltair we SORT it!



At Poltair students will **SORT a PLC** by:

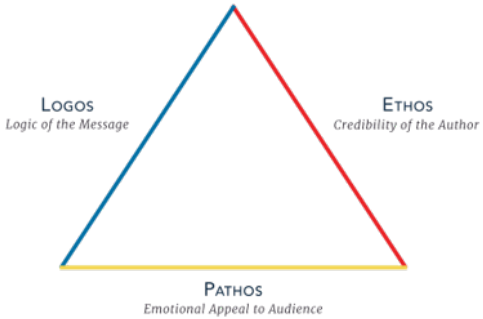
Key Ideas	S	O	R	T
I know and understand the stock characters from Victorian melodrama.				
I know and understand the different physical skills used in melodrama and experiment with them in rehearsals.				
I know and understand the different vocal skills used in melodrama and experiment with them in rehearsal.				
I know the 3-part structure of melodrama performance.				
I can work in a group to plan a melodrama performance.				
I can apply mellodramatic techniques in performance.				

At the beginning of a learning cycle students are to RAG the key ideas they are studying by self-assessing if they are Red – no understanding, Amber – some understanding, Green – full understanding. They are then to put a R, A or G in the **organise** column.

- Students will then prioritise the Red and Amber key ideas when they are revising.
- Students are to summarise the knowledge for each key idea, then use recall strategies before self-quizzing.

Year 9 Learning Cycle 1 English - The Art of Rhetoric

1. The Rhetorical Appeals



2. Subject Vocabulary

2a = inference A prediction about something based on evidence.
2b = rhetoric The art of effective persuasive writing or speaking.
2c = rhetorical question A question asked to make a powerful point and convey an opinion, rather than get an answer.
2d = repetition Use of a word, phrase or sentence more than once.
2e = anaphora The repeated use of a word or phrase at the start of a series of sentences.
2f = emotive language Words or phrases designed to appeal to the feelings of the reader.
2g = rule of three / triple Three words or short phrases used together to build an impactful point.
2h = direct address The use of the pronoun 'you' to give the impression of a writer or speaker communicating directly with an individual.
2i = first person pronouns Words that show a writer is talking about themselves e.g. I, we, us, our.
2j = personal anecdote A short, thought-provoking story relating someone's memorable experience.
2k = pathos A persuasive method designed to appeal to emotion, especially to create feelings of sadness or sympathy.
2l = ethos A persuasive method designed to gain the trust of the reader by presenting the writer as experienced or knowledgeable.
2m = logos A persuasive method designed to present ideas as logical and unquestionable.
2n = hook An opening statement (usually the first sentence) that grabs the reader's attention.
2o = position The writer's stance or view on a subject matter.
2p = counter-argument A view that goes against your own opinion.

3. Characters

3a = Old Major The old boar whose rousing, rhetorical speech about the tyranny of humans incites the rebellion. He dies soon after.

3b = Napoleon The pig who becomes the leader of Animal Farm after the rebellion. Based on Joseph Stalin, the leader of the communist Soviet Union, he is corrupt, sly, lazy and opportunistic. He uses Squealer and the dogs to oppress others.

3c = Squealer A skilled, persuasive orator. He is used to spread the pigs' propaganda and represents the propaganda machine of the communist Soviet Union. He twists the truth and uses false information to ensure the pigs retain their power over the other animals.

3d = Snowball One of the more powerful pigs, he challenges Napoleon for leadership of the farm after the rebellion and the two become increasingly hostile towards one another. He is an idealist but does exploit the animals for his own gain. He is expelled from the farm by Napoleon's dogs and subsequently becomes a scapegoat for anything awful that happens.

3e = Boxer A gentle, hard-working cart-horse to dedicates his life to the pigs' cause, adopting the maxims "I will work harder," and "Napoleon is always right." His toil allows for the building of the windmills. However, his lack of intelligence blinds him to the real intentions of his leaders and he is sent to the slaughterhouse by them.

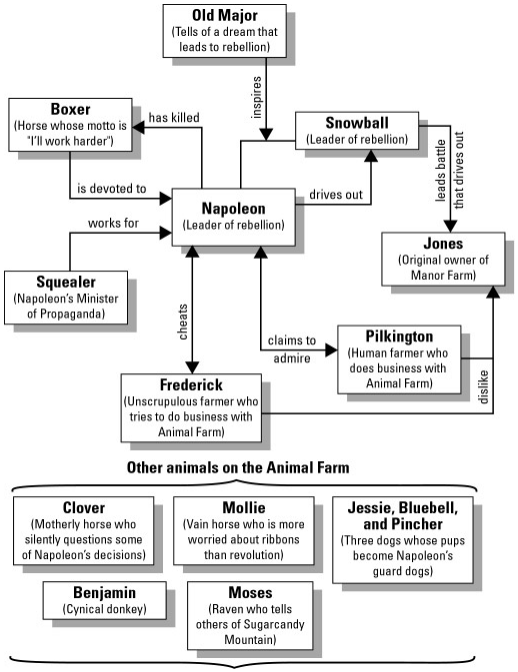
3f = Benjamin A cynical donkey with the view that life will always be painful. Benjamin isn't surprised when the pigs corrupt the revolution and turn the farm into a totalitarian state but fails to stand up to them.

3g = Clover A gentle, motherly, and powerful carthorse. She is distressed by the increasing tyranny of the pigs but lacks the confidence or ability to defend the animals against them.

3h = Mr Jones The original owner of Manor Farm. Once a strict master, in the years before the story begins, Mr. Jones became drunk, careless, and ineffective. The other farmers show no sympathy for him when the farm is taken from him by the animals.

Year 9 Learning Cycle 1 English - Animal Farm

4. Character Map



5. Plot

5a = Chapter 1 Mr Jones – a farmer - drunkenly stumbles to bed for the night, leaving the animals to gather in the barn to hear Old Major's speech. He blames their short and miserable lives on man, inciting rebellion. He teaches them a song: Beasts of England.

5b = Chapter 2 Old Major dies in his sleep. The other animals prepare for rebellion, with the pigs (the cleverest animals) taking a lead role, teaching them animalism, which they do not all understand. Moses tells the animals about Sugarcandy Mountain - a beautiful place where animals go when they die. The Rebellion occurs and Jones is driven from the farm. The farm is renamed 'Animal Farm' and seven commandments are made. Some buckets of milk go missing.

5c = Chapter 3 The animals work hard in the fields throughout the summer - Boxer hardest of all. The harvest is completed quickly. There is conflict between Snowball and Napoleon. Snowball spends time trying to educate the animals, with mixed success. He teaches them the maxim "Four legs good, two legs bad." Napoleon takes a group of puppies away from to 'educate'. When it is noted the pigs have been eating the apples and milk, Squealer persuades the animals that it is for the best.

5d = Chapter 4 News of the rebellion spreads. Jones and the other farmers conduct an attack, attempting to seize the farm. Led by Snowball, the animals fight off the humans. Boxer and Snowball are awarded medals for their heroic efforts, but Boxer is distressed at the thought of killing a human – who is later found to be stunned rather than dead. The conflict is named 'The Battle of the Cowshed'.

5e = Chapter 5 Mollie is tempted away from the farm. While the pigs' influence increases, Snowball and Napoleon grow more hostile towards one another. As Snowball announces new plans for a windmill, Napoleon orders his dogs to attack and chase Snowball from the farm. The animals grow anxious but Squealer placates them. Later, Napoleon announces that the windmill will be built.

5f = Chapter 6 The animals work hard to build the windmill, despite their rations being cut. The pigs begin trading with humans, much to the shock of the other animals, and begin sleeping in beds. A change in the wording of the commandments is noticed. Again, Squealer persuades the animals that this is acceptable. A storm destroys the windmill but Napoleon blames this on Snowball.

5g = Chapter 7 The animals begin to starve. The hens protest after being told they must give their eggs to be sold. Napoleon cut their rations and nine die. Other animals are executed as 'traitors' at Napoleon's meeting. The singing of 'Beasts of England' is outlawed.

5h = Chapter 8 As time passes, the animals work harder for less rations, and more of the commandments change, although the animals are persuaded by Squealer statistics that this is not the case. More trading with the humans take place but Frederick tries to trick Napoleon with forged banknotes. Frederick, with other men, attacks the farm and blows up the windmill. The animals fight back but several die and Boxer is injured. The pigs begin drinking alcohol.

5i = Chapter 9 Napoleon orders a school to be built for the education of the ever-increasing young pigs on the farm. Boxer collapses while working and the pigs announce he will be taken to the hospital. It is revealed that the van that comes to collect Boxer is from the slaughterhouse, although Squealer tries to convince the animals this is not true. Boxer is never seen again.

5j = Chapter 10 Years pass and no animal retires. Few remember the rebellion. The pigs begin to walk on two legs and the commandments are replaced with "All animals are equal but some are more equal than others.". The humans visit and praise the pigs for their efforts. The farm returns to the name 'Manor Farm'. Finally, while the pigs play cards and drink to excess with the humans one evening, the animals realise that they cannot differentiate between the humans and the pigs: they are now one and the same.

6. Context

6a = George Orwell (1903-1950) A writer of fiction, poetry, essays and articles. Despite a privileged upbringing, Orwell went to live among the poor to become a writer, in order for him to experience poverty first hand. Orwell's writing conveys his support of democratic socialism, frequently challenging totalitarianism and social injustice. His most famous books are Animal Farm and 1984. He was inspired to write Animal Farm when he a child whipping a horse, and has the following ideas: "If only such animals became aware of their strength we should have no power over them, and that men exploit animals in much the same way as the rich exploit the working class".

6b = The Russian Revolution Animal Farm is an allegory for the Russian Revolution of 1917 and the subsequent years. The Tsarist regime (led by a rich, autocratic ruler named Tsar Nicholas II and represented in the novel by Mr Jones) was overthrown and replaced by a communist state, led by Vladimir Lenin. Russia was re-named the

Year 9 Learning Cycle 1 English - Animal Farm

Union of Soviet Socialist Republics, just as Manor Farm is renamed Animal Farm.

6c = Vladimir Lenin Lenin believed that the country should be run for the benefit of the working class. He was the leader of The Bolshevik Party who seized control after the 1917 revolution. He is represented by Old Major in the novel. He was inspired by Karl Marx's theory of Communism, which urges the "workers of the world" to unite against their economic oppressors, just as Animalism urges the animals to do.

6d = Joseph Stalin A revolutionary who changed his name to Stalin, which means 'man of steel'. Following the death of Lenin in 1924, Stalin rose to power through manipulating and intimidating others, sidelining other potential leaders such as Victor Trotsky. Under Stalin, the Soviet Union became more autocratic and totalitarian: he oversaw mass repressions, hundreds of thousands of executions and ordered over 22 million of deaths. In the novel, Napoleon represents Stalin.

6e = Victor Trotsky A skilful rhetorical speaker and one of the cleverest men in the communist party. Snowball's plans for the windmill and programs reflect Trotsky's intellectual character and ideas about the best ways to transform Marx's theories into practice.

7. Authorial Intent

George Orwell wrote this novel for a purpose and uses the plot and characters to send a message to his readers...

7a = To criticise... the development and corruption of Soviet communism under Stalin, which departed from the socialist ideals upon which the revolution was built, and allowed for those in charge to manipulate and oppress those less powerful.

7b = To highlight... the plight of the working classes in the communist Soviet Union and how their oppression led to suffering and death.

7c = To convey... the injustice of a hierarchical class system and how class divisions lead to misery for those at the bottom of the hierarchy.

7d = To warn... of the dangers of manipulation of propaganda and false information, especially when presented to those who lack the necessary education to interpret information critically.

8. Vocabulary

6a = socialism (noun) The organisation of a country's economy allowing for workers to have a share in the organisations that earn money. Its goal is to spread wealth more evenly and treat workers more fairly.

8b = communism (noun) A way of organising a country in such a way that does not allow for private property or a class system. All goods are owned and made available to everyone as they need them.

8c = oppression (noun) Extended cruel or unfair treatment of people by those in power.

8d = corrupt (adjective) Acting in a way that is dishonest or harmful, for personal gain.

8e = rebellion (noun) The act of violent action by a group of people trying to overthrow those in power.

8f = glorify (verb) To describe or represent something as admirable or worthy of praise, especially if it is not

8g = propaganda (noun) Information, especially misleading in nature, used to convince people to follow a particular cause or point of view

8h = dictator (noun) A ruler with total power over their country.

8i = totalitarian (adjective) A government and system in which those in power have complete control.

8j = exploit (verb) To use someone unfairly for your own gain.

9. Subject Vocabulary

9a = allegory A story that can be interpreted to reveal a hidden meaning, typically a moral or political one.

9b = fable A short story, typically with animals as characters, conveying a moral.

9c = moral A lesson that can be learnt from a story or experience.

9d = satire The use of irony, sarcasm or ridicule in revealing someone's flaws or mistakes

9e = symbolism The use of characters, events or ideas to represent something broader

9f = polemic A strong verbal or written attack on someone or something.

9g = plot The main events of a play, novel or film.

9h = inference A prediction about something based on evidence.

9i = characterisation The creation of a character e.g. appearance, motives, actions, inner thoughts.

9j = setting Where or when a story is set, usually introduced at the exposition (beginning) of a story along with the characters.

Year 9 Learning Cycle 1 English - Noughts and Crosses (Play)

1. Characters

THE MCGREGOR FAMILY
O

RYAN
Ryan does all that he can to protect his family. He, alongside Jude, joins the Liberation Militia. However, as a result of his loyalty to this cause, and his devotion to his family, Ryan is imprisoned.

MARGARET (MEGGIE)
Meggie is a protective woman. For fourteen years, she worked for the Hadley family as a member of household staff. However, after being sacked by the Hadley family, Meggie and her family suffer financial hardship.

LYNETTE
Lynette is Jude and Callum's older sister. Previously, she dated a Cross and as a result, she was attacked by some noughts. Consequently, due to the trauma, the attack affects Lynette mentally.

JUDE
Callum's older brother, who displays violent and aggressive tendencies. While Callum is resolved to playing the system and becoming successful within it, Jude is concerned with rebellion, becoming involved with a terrorist organisation.

CALLUM
Callum is intelligent and hard-working. During childhood, he was best friends with Sephy, sharing a close connection, and later entering into a romantic relationship. With the help of a scholarship, Callum is able to join Sephy's 'Cross' school, which leads to discrimination and bullying.

THE HADLEY FAMILY
X

KAMAL
Kamal strongly dislikes noughts. Kamal is a government official, and he regards Crosses as superior to noughts. His belief in the importance of segregation drives his behaviour in the novel.

JASMINE
Despite her family's power and status, Jasmine suffers throughout the book. Her husband's neglect causes Jasmine to feel lonely, insignificant and powerless.

PERSEPHONE (SEPHY)
'Sephy' is the daughter of the powerful Kamal Hadley. She is a Cross, meaning that she was born with a certain amount of privilege, which is contrasted with her childhood friend Callum. Initially, Sephy is naïve to the brutal world around her. However, she learns to sympathise with Callum's suffering.

MINERVA (MINNIE)
Minerva is the older sister of Sephy. Often, Minerva does not agree with Sephy's positive opinions of noughts. Despite frequent arguments with her sister, Sephy does sometimes confide in Minerva.

2. Context

2a = On the Stage The play is a stage version of Malorie Blackman's dystopian novel of the same name. The Royal Shakespeare Company used the Dominic Cooke adaptation of the story and their production ran at the Civic Hall in Stratford-upon-Avon in winter 2007 and toured the UK in 2008.

2b = Malorie Blackman's Motivation 'I wanted to turn society as we know it on its head in my story, with new names for the major divisions in society. I wanted to see this new world through the eyes of the main two characters, Callum (a nought) and Sephy (a Cross). Race and racism are emotive issues that most people are loathe to discuss, but I think they should be discussed, no matter how painful.'

2c = Apartheid From 1948-1994, the South African government enforced apartheid. This meant that black and white people were forced to live separately, go to different schools and black people could not vote. White people got privileges and ruled the country. However, this all came to an end when black people finally got the right to vote and elected Nelson Mandela as president. He had spent 27 years in prison for fighting for black people's rights.

2d = Slavery In the USA, white landowners used black slaves to work their farms until the 1860s. Even after slavery was abolished black people often continued to work on the farms in the southern states, in bad conditions and for poor wages, or as servants or manual labourers. Even now, 150 years later, black communities in the USA are often worse off than white communities. The story of Noughts & Crosses is set at a time when people can still remember noughts being slaves.

2e = All-white schools Up until 1954 in many areas of the USA there were separate schools for black children and white children. This was finally made illegal in 1954. Schools quickly opened their doors to black children but there was a lot of resentment. At one school in Little Rock, Arkansas, in 1957, there was a full-blown riot when black pupils tried to enter the school

Year 9 Learning Cycle 1 English - Noughts and Crosses (Play)

3. Plot

The Story Noughts & Crosses tells the story of two young people: a girl called Sephy and a boy called Callum. Callum is a nought – he's white, from a poor family and lives on a rough estate. Sephy is a Cross – she's black, from a wealthy, powerful family and lives in a grand country house with a private beach.

The story takes place in world very similar to our own, apart from the massive split between noughts and Crosses. Crosses are the ruling class and noughts struggle against prejudice, poverty and low status.

It's almost unheard of for a Cross to be friends with a nought, but Sephy and Callum are very close and eventually become lovers. Even so, Callum sometimes feels Sephy doesn't understand the prejudice he faces. Sephy is frustrated that Callum doesn't realise how hard she tries to understand and that she has her own problems with her cold, snobbish family.

Callum's dad and brother get involved with a nought terrorist organisation. Callum initially hates the violence but after his sister dies and his dad is killed in prison, he turns terrorist too. He hardens himself to the violence but when he is involved in kidnapping Sephy, he realises that he should never have joined the organisation.

Despite Sephy and Callum's love for each other, there's no place in their society for a nought and a Cross who want to be together. The story ends with Sephy pregnant with Callum's child and Callum being executed for terrorism.

4. Vocabulary

4a = inequality (noun) a situation in which money or opportunities are not shared equally between different groups in society

4b = terrorism (noun) violent, criminal acts committed by individuals or groups designed to influence the government or intimidate the public

4c = disconcerting (adjective) causing someone to feel on edge, unsettled or anxious

4d = discrimination (noun) the unfair treatment of different groups of prople, especially due to their race, gender or disability

4e = victimised (verb) singled out for cruel or unfair treatment

4f = intolerance (noun) a state in which someone is unable to accept views, beliefs or behaviour that is different from their own

4g = empathy (noun) the ability to understand and share the feelings of another

4h = unjust (adjective) not based on or behaving in a way that is morally right or fair

4i = prejudiced (adjective) having or showing a dislike or distrust that is based on unreasonable hatred towards a group or individual

4j = liberation (noun) the act of setting someone free

4k= manipulate (verb) control or influence someone often unfairly or dishonestly

4l = ambiguous (adjective) unclear; open to more than one interpretation

5. Subject Vocabulary

5a = play (noun) A dramatic piece of literature intended to be acted out on the stage.

5b = act (noun) A way of dividing a play. Each act is a group of scenes.

5c = act (noun) A way of dividing a play. Each act is a group of scenes.

5d = stage direction (noun) An instruction in a play that tells actors how to move or speak, or gives information about the setting, sound effects or lighting.

5e = structure (noun) The way a play, novel or poem is constructed and linked together.

5f = episodic (noun) A piece of writing that consists of a series of events, which might seem not to be connected.

5g = prologue (noun) A separate section that can appear before a novel or play that might reveal something that has happened before the story begins

5h = props (noun) Any movable articles or objects used on the set of a play.

5i = climax The part of the story where the suspense reaches its highest part.

5j = soliloquy (noun) a speech in a play that the character speaks to himself or herself or to the people watching rather than to the other characters.

5k = declarative (noun) a sentence that makes a statement

5l = interrogative (noun) a sentence that asks a question

5m = imperative (noun) a sentence giving a command or an order

Year 9 Learning Cycle 1 Maths

Key Terms	Description
Prime number	A number whose only factors are one and itself
HCF	The highest number which goes into both quantities given
LCM	The first number which is a multiple of all of the quantities given
Factor	A number which can be multiplied to reach the starting number
Variable	A letter which is used to represent an unknown quantity
Expression	An algebraic statement including terms and operations
Term	A collection of variables and numbers
Equation	An algebraic statement with an equals sign in the middle
Mean	An average to represent a set of data. Add all of the numbers together, and divide by the quantity of numbers
Median	The middle number in a list, when the numbers have been ordered
Mode	The most common item in a lost
Range	The difference between the largest number and the smallest number in a set of data
Perimeter	The distance around the outside of a shape
Area	The amount of 2d space a shape takes up
Parallelogram	A quadrilateral with two pairs of parallel sides
Trapezium	A quadrilateral with one pair of parallel sides
Perpendicular	At 90 degrees
Indices	Numbers which have a power
Standard form	A system for writing very large or very small numbers, using powers of 10

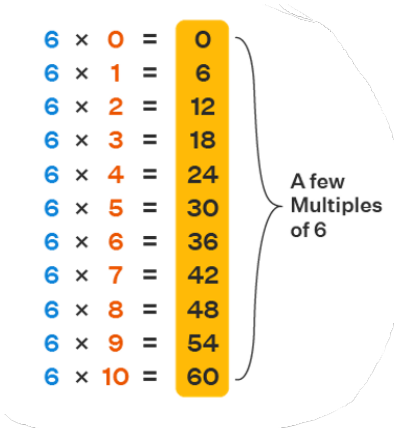
Year 9 Learning Cycle 1 Maths - Factors, multiples & primes

1. What are factors?

30

Factor pairs	Products
1 30	1 × 30 = 30
2 15	2 × 15 = 30
3 10	3 × 10 = 30
5 6	5 × 6 = 30

2. What are multiples?



3. What are primes

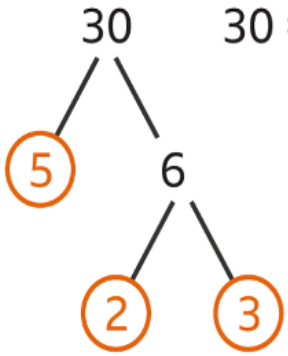
2 3 5 7 11 13 17
19 23 29 31 37 41
43 47 53 59 61 67
71 73 79 83 89 97

Numbers which have exactly two factors:

1 and itself

4. Prime factor decomposition

1. Break number down into factor pairs
2. Circle prime numbers
3. Write final answer as a product



30 = 2 × 3 × 5

This is called writing a number as a *product of its prime factors*

5. HCF & LCM from a list

Multiples of 4:

4 8 12 16 20 24 28 32 36 40

Multiples of 5:

5 10 15 20 25 30 35 40

LCM (4, 5) = 20

Factors of 18 are:

1 2 3 6 9 18

Factors of 27 are:

1 3 9 27

Common Factors : 1, 3 and 9 (HCF)

6. HCF & LCM from product of primes

HCF- Multiply the numbers which appear in both lists

12 = 2 x 2 x 3
18 = 2 x 3 x 3
Common factors = 2, 3
HCF = 2 x 3 = 6

LCM- HCF x the numbers leftover in both lists

LCM= 6 x 2 x 3
LCM = 36

Year 9 Learning Cycle 1 Maths - Manipulation of Algebra

1. Substitution

Replacing variables with numbers and evaluating the expression.

$3a - 2b \quad (a = 10 \quad b = 4)$

$= 3(10) - 2(4)$

$= 30 - 8$

$= 22$ ✓

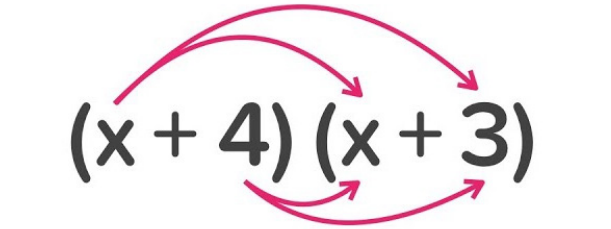
2. Expanding single brackets

The **green arrow** shows the first calculation $2 \times 3a = 6a$

The **red arrow** shows the second calculation $2 \times 5 = 10$

This gives the final answer as $6a+10$

3. Expanding double brackets



$x^2 + 3x + 4x + 12$

$x^2 + 7x + 12$

4. Expanding double brackets

$(5x + 2)^2$

$(5x + 2)(5x + 2)$

$25x^2 + 10x + 10x + 4$

$25x^2 + 20x + 4$

5. Factorising single brackets

Factorising

$3x + 6 \equiv 3(x + 2)$

Expanding brackets

The factor out the outside of the bracket must be the HCF of the terms .

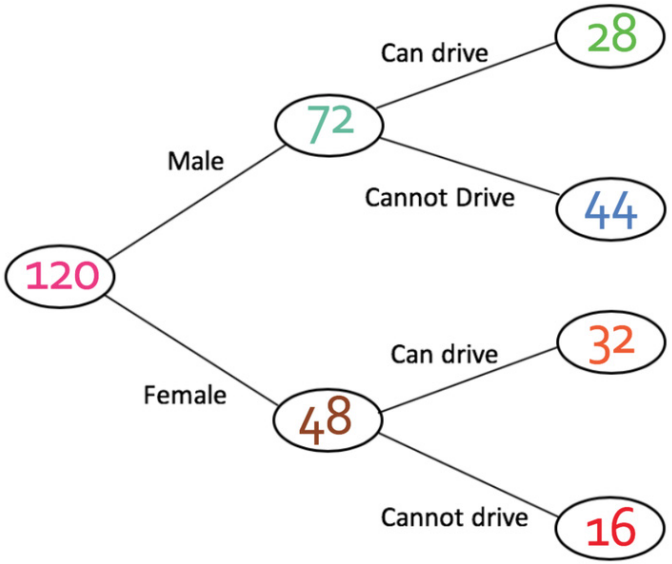
Year 9 Learning Cycle 1 Maths - Tables and averages

1. Two-way tables

	Baseball	Basketball	Football	Total
Male	13	15	20	48
Female	23	16	13	52
Total	36	31	33	100

Each row has a total and each column has a total. These can be used to find missing values.

2. Frequency trees



Each pair of numbers add together to make the number which they are connected to with straight lines in a v-shape.

3. Averages from a list

Mode: most common item in the list

Median: middle item when the list is ordered

Range: largest value – smallest value

Mean: Add all numbers together and divide by the quantity of items in the list

4. Averages from a table

Number of goals	Frequency
0	7
1	3
2	3
3	1
4	1

Mode- value with the highest frequency

Mode = 0

Median: middle number

There are 7+3+3+1+1=15 numbers

Median is the 8th number

Median = 1

Range: largest value – smallest value

4-0 = 4

Range = 4

5. Mean from a table

Number of people	Frequency	Number × Frequency
1	5	1 × 5 = 5
2	6	2 × 6 = 12
3	3	3 × 3 = 9
4	2	4 × 2 = 8
	n = 16	Total = 34

Mean: Add all numbers together and divide by the quantity of items in the list

Mean = 34 ÷16

Mean = 2.125

6. Estimate of the mean

Marks scored	Frequency	Mid-point	Frequency × Mid-point
0 - 9	3	$\frac{0+9}{2} = 4.5$	3 × 4.5 = 13.5
10 - 19	5	$\frac{10+19}{2} = 14.5$	5 × 14.5 = 72.5
20 - 29	8	$\frac{20+29}{2} = 24.5$	8 × 24.5 = 196
30 - 39	4	$\frac{30+39}{2} = 34.5$	4 × 34.5 = 138
	n = 20		Total = 420

Mean: Add all numbers together and divide by the quantity of items in the list. If you do not know the exact numbers, use the midpoint of the group.

Mean = 420 ÷20

Mean = 21

7. Reverse mean

The mean height of seven pupils is 123cm.

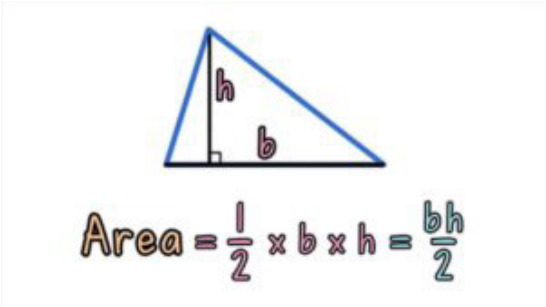
One pupil of heigh 147cm leaves the group.

Find the mean height of the remaining six pupils.

- Find the total height of 7 pupils
- Subtract the 147cm to find the total height of 6 pupils
- Divide by 6 to find the mean

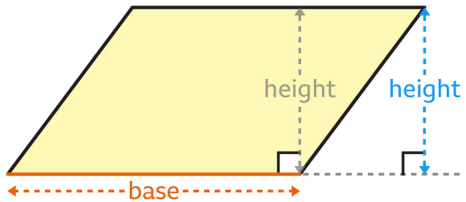
Year 9 Learning Cycle 1 Maths - Perimeter & area

1. Area of a triangle



The height is perpendicular to the base

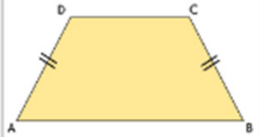
2. Area of parallelogram



The height is perpendicular to the base

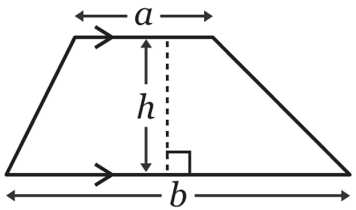
3. What is a Trapezium

Quadrilateral with one pair of parallel sides

Types of Triangle	Shape	Definition
Isosceles Trapezium		The trapezium which has legs of equal length is called an isosceles trapezium. Here, AD = BC
Scalene Trapezium		The trapezium whose neither the sides nor the angles are equal is a scalene trapezium.
Right Trapezium		The trapezium which has right angles in a pair are known as right trapezium.

4. Area of a trapezium

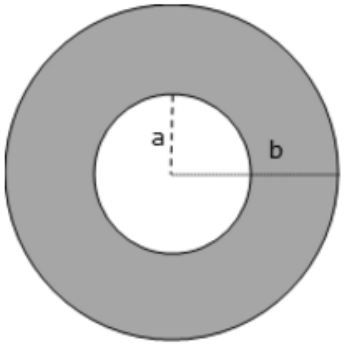
$$A = \frac{1}{2}(a + b)h$$



a and b are the parallel lines.

The height is perpendicular to a and b.

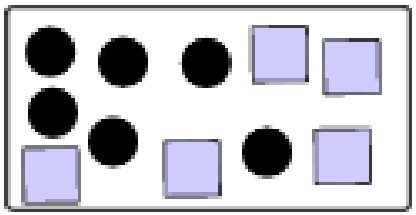
5. Compound shape areas



Area of big shape – are of small shape

Year 9 Learning Cycle 1 Maths - Ratio

1. Forming ratio



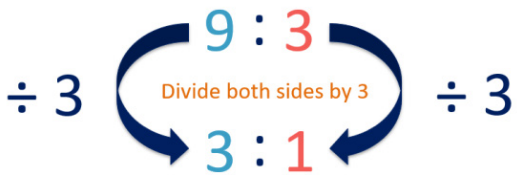
Circles : squares

6:5

Ratios describe relationships between two quantities.

Give the values in the order that the items were mentioned i.e. circles first.

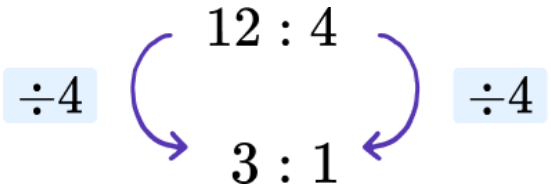
2. Simplifying ratio



Look for a common factor in the numbers which make up the ratio.

Divide by the common factor

3 Writing in the form n:1



Simplify the ratio as before, but instead of choosing the common factor, divide to get a 1 where the question asks for a 1.

4. Writing ratio as Fraction

b : r

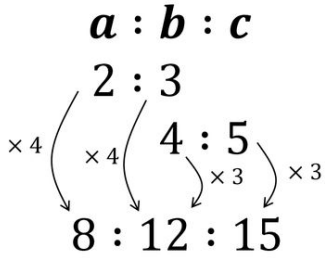
3 : 2

The fraction for blue is $3/(2+3)=3/5$

The fraction for red is $2/(2+3)=2/5$

5. Combining ratios (H)

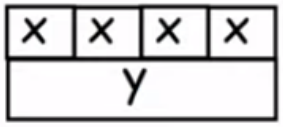
If a:b = 2:3 and b:c=4:5, find a : b : c



1. Find the LCM of the overlapping numbers.
2. Convert both ratios to equivalent ratios with the LCM as the overlapping number
3. Combine

6. Writing equations as ratios (H)

Write 4x = y as a ratio x : y



x : y

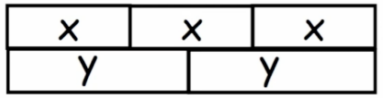
1 : 4

X is the smaller quantity.

7. Writing ratios as equations (H)

Given x : y = 2 : 3

write an equation linking x and y.



3x = 2y

Year 9 Learning Cycle 1 Maths - Indices, powers, roots, standard form

1. Index laws

Laws of indices

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

2. Negative Indices

$$a^{-n} = \frac{1}{a^n}$$

Example

$$5^{-2} = \frac{1}{5^2} = \frac{1}{25}$$

3. Unit Fraction indices

$$a^{\frac{1}{n}} = \sqrt[n]{a}$$

$$27^{\frac{1}{3}} = \sqrt[3]{27} = 3$$

$$32^{\frac{1}{5}} = \sqrt[5]{32} = 2$$

$$\left(\frac{16}{25}\right)^{\frac{1}{2}} = \frac{16^{\frac{1}{2}}}{25^{\frac{1}{2}}} = \frac{\sqrt{16}}{\sqrt{25}}$$

4. Standard form

$$a \times 10^n$$

1 ≤ a < 10

n is an **integer**.

Big numbers- positive n value

345000000000= 3.45×10^{11}

Small numbers- negative n value

0.0000345= 3.45×10^{-5}

Year 9 Learning Cycle 1 Maths - Calculator Features

×	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

Square numbers: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144

Cube Numbers : 1, 8, 27, 64, 125

Prime numbers: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47...

Useful features on your calculator:

FACT: this express a number as a product of its prime factors

RATIO (menu 4): this will find missing values within equivalent ratios

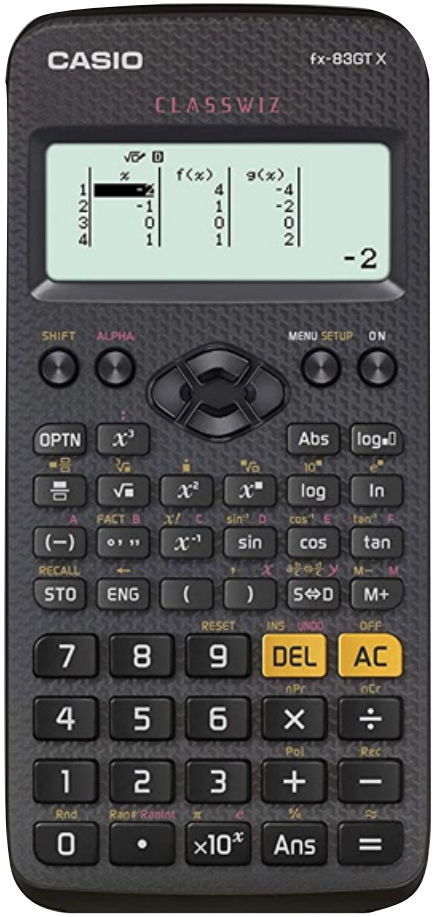
Table (menu 3): This is where you can generate values within a table- useful for plotting graphs and generating terms of a sequence

Statistics (menu 2): this will find all of the averages from a table of data

°‘“: This Is the time button and can do conversion between time units, as well as calculations with different times

Fraction button: can be used for ay calculations with fractions

S-D: Converts decimal answers to fractions and vice vera



Sparx Maths

Homework will be set on Tuesdays and will be due on the following Tuesday morning at 7:30am

You must complete 100% of the homework- if you have not got 100% of the questions correct, then you have not done your homework

You will receive a merit for completion of your homework

If you complete one of the extra homeworks- XP Boost or Target, you will receive another merit.- they must be 100% complete

Sparx clinics will run Monday, Tuesday, Thursday in Arc 2- a Maths teacher will be on hand to support you, if you are unsure of any of the notes covered

It is your responsibility to seek help BEFORE the deadline, if you get stuck

Your bookwork will be checked in lessons- you must write full workings

You must bring your homework book to the first lesson after Tuesday 7:30am- if you do not have your book, then you have not completed your homework

Year 9 Learning Cycle 1 Science - How can I use the Periodic Table?

Group 1 – Alkali Metals

Group 7 – **Halogens**

Group 0 – **Noble gases**

Group number – tells you the number of **electrons** in an elements **outer** shell.

Elements in the **same group** have **similar properties**.

Element **symbol**
Element **name**

Mass Number = number of **protons** and **neutrons** added together.

Atomic / Proton Number = number of **protons** which is the same as the number of **electrons**.

Neutrons = Mass number – Atomic number

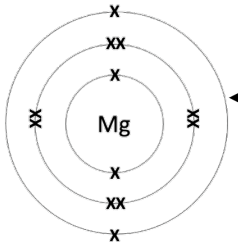
relative atomic mass
atomic symbol
name
atomic (proton) number

1	2											3	4	5	6	7	0
																	4 He helium 2
7 Li lithium 3	9 Be beryllium 4											11 B boron 5	12 C carbon 6	14 N nitrogen 7	16 O oxygen 8	19 F fluorine 9	20 Ne neon 10
23 Na sodium 11	24 Mg magnesium 12											27 Al aluminium 13	28 Si silicon 14	31 P phosphorus 15	32 S sulfur 16	35.5 Cl chlorine 17	40 Ar argon 18
39 K potassium 19	40 Ca calcium 20	45 Sc scandium 21	48 Ti titanium 22	51 V vanadium 23	52 Cr chromium 24	55 Mn manganese 25	56 Fe iron 26	59 Co cobalt 27	59 Ni nickel 28	63.5 Cu copper 29	65 Zn zinc 30	70 Ga gallium 31	73 Ge germanium 32	75 As arsenic 33	79 Se selenium 34	80 Br bromine 35	84 Kr krypton 36
85 Rb rubidium 37	88 Sr strontium 38	89 Y yttrium 39	91 Zr zirconium 40	93 Nb niobium 41	96 Mo molybdenum 42	[97] Tc technetium 43	101 Ru ruthenium 44	103 Rh rhodium 45	106 Pd palladium 46	108 Ag silver 47	112 Cd cadmium 48	115 In indium 49	119 Sn tin 50	122 Sb antimony 51	128 Te tellurium 52	127 I iodine 53	131 Xe xenon 54
133 Cs caesium 55	137 Ba barium 56	139 La* lanthanum 57	178 Hf hafnium 72	181 Ta tantalum 73	184 W tungsten 74	186 Re rhenium 75	190 Os osmium 76	192 Ir iridium 77	195 Pt platinum 78	197 Au gold 79	201 Hg mercury 80	204 Tl thallium 81	207 Pb lead 82	209 Bi bismuth 83	[209] Po polonium 84	[210] At astatine 85	[222] Rn radon 86
[223] Fr francium 87	[226] Ra radium 88	[227] Ac* actinium 89	[267] Rf rutherfordium 104	[270] Db dubnium 105	[269] Sg seaborgium 106	[270] Bh bohrium 107	[270] Hs hassium 108	[278] Mt meitnerium 109	[281] Ds darmstadtium 110	[281] Rg roentgenium 111	[285] Cn copernicium 112	[286] Nh nihonium 113	[289] Fl flerovium 114	[289] Mc moscovium 115	[293] Lv livermorium 116	[293] Ts tennessine 117	[294] Og oganesson 118

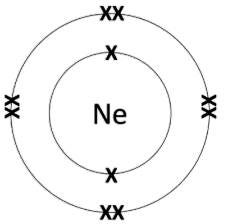
Non-Metals

Transition Metals

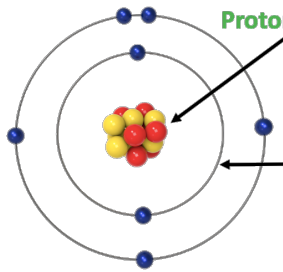
Noble gases have a **full outer shell** of electrons E.g., Neon (Ne)



Magnesium (Mg) has **12 electrons** in total. It is in **group 2** so has 2 electrons in its **outer** shell. Mg's electronic configuration is 2,8,2.



Subatomic Particle	Mass	Charge
Proton	1	+1
Neutron	1	0
Electron	Negligible	-1



Year 9 Learning Cycle 1 Science - Experiments

Key Terms	Description
Independent variable	The variable you change in an investigation
Dependent variable	The variable you measure in an investigation
Control variable	The variable you keep the same in an investigation
Hypothesis	A prediction of what will happen in an investigation
Reliability	We use control variables to ensure a reliable experiment
Reproducible	To re-do our experiment and get similar results due to a reliable method
Mean	Doing an experiment 3 times then dividing by 3 to get an average
Fair test	An experiment where only the independent variable changes
Anomalous result	Result that does not fit with the rest of the data

1. Designing and performing experiments

1. ***Repeatable*** – The **same** person gets the **same results** after repeating the experiment using the same method and equipment.
2. ***Reproducible*** – Similar results can be achieved by **someone else** or using a **different method**/piece of equipment.
3. ***Accurate*** – Results are close to the true answer
4. ***Precise*** – data is **close** to the **mean** (or the average!)

For data to be reliable, it must be **repeatable** and **reproducible**

2. The Variables

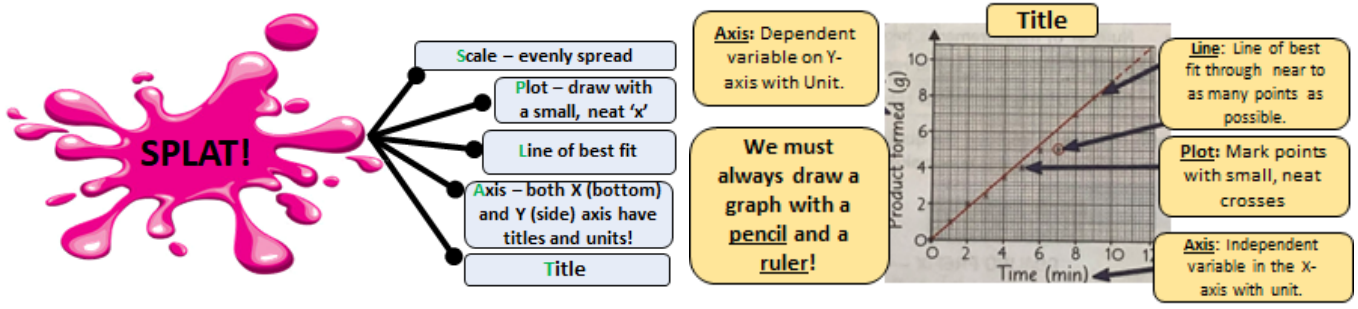
Independent variable – the thing we change!

Control variables – these are things we **keep the same** to ensure a reliable experiment (one we can repeat and reproduce.

Dependent variable – the thing we are **measuring** overall.

Variable	Example
Independent variable	I want to see if how hot water is increases the rate of diffusion from a teabag. So, I am changing the temperature (degrees Celsius) of water.
Control variables	I want **keep everything else the same**, e.g., the type of teabag, the volume of water (mL) used, the timer started at the same time, the same end point.
Dependent variable	I want to know if increasing water temperature increases the rate of diffusion from a tea bag. Therefore, I want to **measure** the rate of diffusion!

3. Presenting Data



Drawing conclusions from data:

1. State the **relationship** between the independent and dependent variable, e.g., **'as the time increases the product formed increases.'**
2. **Use statistics to support your answer.** 'For example, at 10 minutes there was 50g of product, compared to 160g at 20 minutes'
3. **Refer to the original hypothesis – does the data support this?**

When **evaluating** think of the **positives** and **negatives** of the method (the validity - did they use enough controls? And of the results – were results **reliable, accurate, reproducible?**) and come to an overall conclusion.

Year 9 Learning Cycle 1 Science - Key Terms

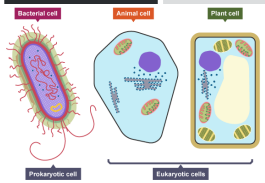
1. Key Terms	Description
Cell	The smallest living unit. All living organisms are made of cells
Eukaryote	An organism consisting of a cell or cells in which the DNA is contained within a nucleus (animals and plants)
Prokaryote	An organism in which the DNA is not contained within a nucleus (bacteria)
Organelle	A subcellular (smaller than a cell) structure found within a cell
Diffusion	The movement of particles from a high concentration to a low concentration
Active Transport	The movement of particles from a low to high concentration, moving against the concentration gradient. This process requires energy
Osmosis	The movement of water particles from an area of high concentration to low concentration gradient
Mitosis	Cell division that produces two genetically identical daughter cells
Stem Cell	An undifferentiated cell that can become any other type of cell
Vaccination	Treatment with a dead or inactive form of the pathogen to prevent disease
Pathogen	A microorganism that causes disease
Phagocytosis	The engulfing of a pathogen by a phagocyte (white blood cell)
Lymphocyte	A white blood cell that is able to produce antibodies
Phagocyte	A white blood cell that is able to produce antibodies
Placebo	A fake or dummy drug
Double Blind Trial	Part of a clinical trial where neither the doctor or the patient know whether they are receiving the active drug or a placebo

Key Terms	Description
Atom	The smallest part of an element which can exist. Atoms have a nucleus, containing protons and neutrons, with electrons orbiting in shells
Element	A substance made of only one type of atom
Compound	A substance made of more than one element, chemically bonded together
Ionic bonding	The electrostatic attraction between two oppositely charged ions
Covalent bonding	A shared pair of electrons between two non-metals
Fractional distillation	Using heat to separate a mixture of substances as the substances have different boiling points
Ore	A compound that contains enough of a metal to make it economically viable to extract the metal from it
Displacement	When a more reactive substance reacts and swaps places with a less reactive substance.
Electrolysis	Using electricity to decompose a compound

Year 9 Learning Cycle 1 Science - Cell Biology

2. Cell Biology

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

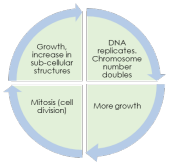


Magnification = size of image / size of real object

Embryonic stem cell	Can divide into most types of cell. Therapeutic cloning – embryonic stem cells produced with same genes as patient. No rejection.
Adult stem cell	Can divide into a limited number of cells e.g. bone marrow stem cells can form various blood cells.

https://www.bbc.co.uk/bitesize/guides/zwnp7p3/revision/5

3. Cell Cycle



Number of sub-cellular structures (e.g. ribosomes and mitochondria) increase.

Number of chromosomes double.

One set of chromosomes is pulled to each end of the cell.

The nucleus divides.

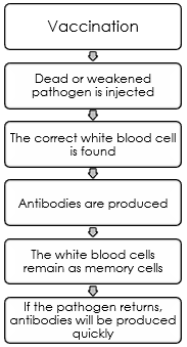
Cytoplasm and cell membranes divide to form two identical cells

4. Cell Transport

Diffusion	Spreading out of the particles (gas/ solution) resulting in a net movement from an area of higher concentration to an area of lower concentration.	Oxygen and carbon dioxide in gas exchange (leaves and alveoli). Urea from cells into the blood plasma for excretion in the kidney
Osmosis	The diffusion of water from a dilute solution to a concentrated solution through a partially permeable membrane.	Movement of water into and out of cells
Active Transport	The movement of substances from a more dilute solution to a more concentrated solution (against a concentration gradient). Requires energy from respiration.	Absorption of mineral ions (low concentration) from soil into plant roots. Absorption of sugar molecules from lower concentrations in the gut into the blood which has a higher sugar concentration.

5.Pathogens

	Pathogen	How it is spread	Prevention/ Control
Measles	Virus	Droplets from sneezes and coughs	Vaccination of children
HIV	Virus	Sexual contact, needle exchange	Antiretroviral drugs when infected
Salmonella	Bacteria	Infected food	Vaccination of poultry (chickens)
Gonorrhoea	Bacteria	Sexual contact	Controlled by antibiotics. Spread prevented by condoms
Malaria	Protist	By a vector – mosquito	Preventing mosquitos from breeding, using mosquito nets



6. Further reading, websites

Types of microscope: https://www.bbc.co.uk/bitesize/guides/z84jtv4/revision/5

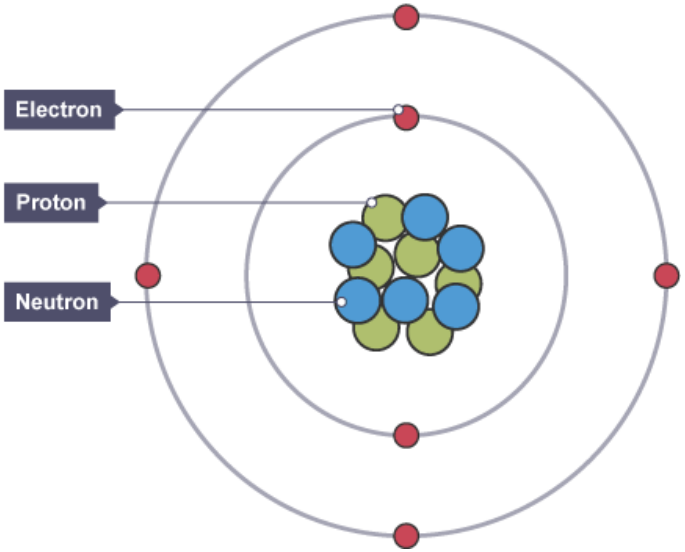
Defence against disease: https://www.bbc.co.uk/bitesize/guides/zs6q2p3/revision/4

Drug development: https://www.bbc.co.uk/bitesize/guides/z8fkmsg/revision/10

Cell cycle: https://www.bbc.co.uk/bitesize/guides/z2kmk2p/revision/2

Year 9 Learning Cycle 1 Science - Atomic structure and bonding

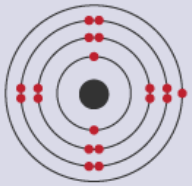
1. Atomic Structure



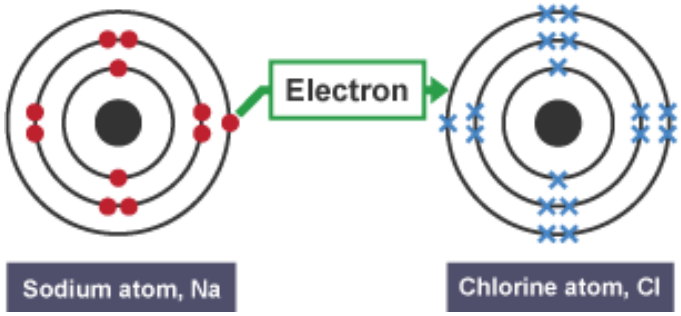
Subatomic particle	Relative mass	Relative charge
Proton	1	+1
Neutron	1	0
Electron	Very small	-1

2. Electronic structure

Electrons orbit the nucleus at different energy levels called shells. The first shell can hold 2 electrons, the second and third can only hold up to 8 electrons

Atomic number	Name	Electronic configuration	Diagram of atom
3	Lithium	2.1	
11	Sodium	2.8.1	
19	Potassium	2.8.8.1	

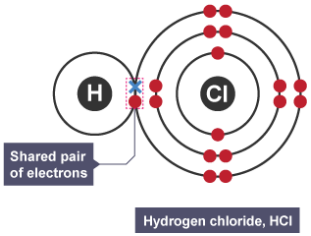
3. Ionic bonding



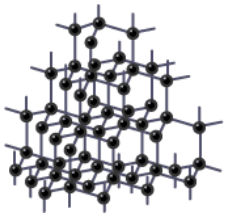
Giant ionic lattices, such as sodium chloride (NaCl) have high melting and boiling points because of strong electrostatic attractions between ions. They only conduct electricity when molten or dissolved.

4. Covalent bonding

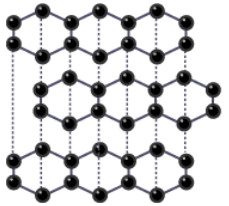
Simple molecules, such as water (H2O) and hydrogen chloride (HCl) have low melting and boiling points because they have weak intermolecular forces between molecules



Giant covalent structures, such as diamond and graphite have very high melting and boiling points

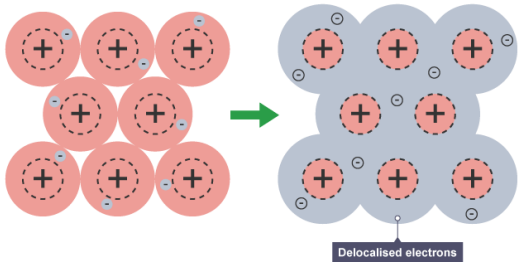


Diamond – each carbon atom forms 4 covalent bonds with another carbon atom.



Graphite – each carbon atom forms 3 covalent bonds. Graphite conducts electricity because there are delocalised electrons between layers.

5. Metallic bonding

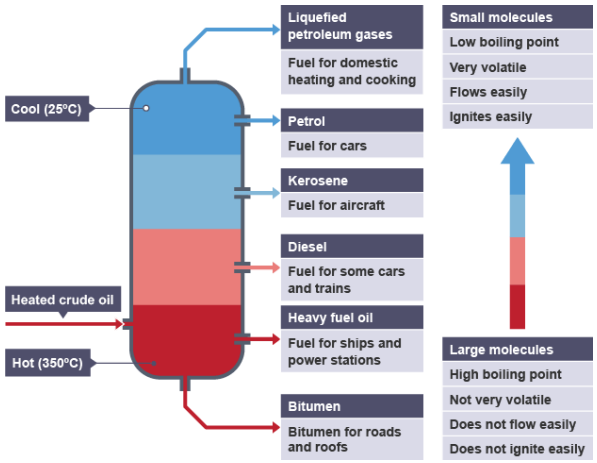


Metallic structures are good conductors of heat and electricity because they have delocalised electrons. They are malleable because layers of positively charged metal ions can slide.

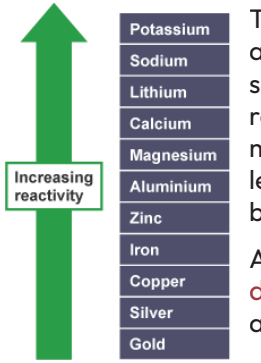
Year 9 Learning Cycle 1 Atomic structure and bonding

6. Fractional distillation

Fractional distillation separates substances in a mixture based on their boiling point. We can use it to separate the compounds in crude oil.



7. Reactivity Series



The reactivity series is like a league table of metals sorted into order of reactivity. The most reactive metal is at the top and the least reactive metal is at the bottom

A more reactive metal can displace (swap places with) a less reactive metal.

magnesium + copper sulfate → copper + magnesium sulfate

potassium + calcium nitrate → calcium + potassium nitrate

8. Extracting metals

Metal	Method	Reactivity
Potassium	Electrolysis of molten compounds	Most reactive
Sodium		
Lithium		
Calcium		
Magnesium		
Aluminium		
(Carbon)		
Zinc	Heating with carbon	
Iron		
Copper		
Gold	Various chemical reactions	Least reactive

Less reactive metals can be extracted from their ores using displacement. They are roasted with carbon in a process called smelting More reactive metals need to be extracted by electrolysis.

Electrolysis uses electricity to break the compound down into ions that then separate.

9. Environmental impacts of mining

1. Digging ores out of the ground is noisy, can cause dust and air pollution and leaves unsightly waste/holes in the ground.
2. Both smelting and electrolysis require lots of energy. This makes the process expensive and can also cause carbon dioxide to be released into the atmosphere. This causes global warming.
3. Recycling of metals is a more sustainable option because less ores have to be extracted and less energy is needed to recycle metals than extract new ones.
4.

10. Further Links

Atomic structure
https://www.bbc.co.uk/bitesize/guides/z3sg2nb/revision/3

Bonding
https://www.bbc.co.uk/bitesize/topics/zq6h2nb

Reactivity series
https://www.bbc.co.uk/bitesize/guides/zsm7v9q/revision/1

Year 9 Learning Cycle 1 Science - How to Approach 6 Mark Questions

1. How to approach 6 mark questions in Science - Cell Biology

Question	Describe what a vaccination is and explain how they protect from infection. Explain what antibiotics are and why they can't be used to treat viral diseases. Describe and explain the process of developing new drugs
Info	At least one of these questions is likely to come up. The examiner is going to be looking for a clear answer in a logical sequence
Top tip	Be careful that you use key words/phrases accurately (these are in bold in your model answers below)
Model answer	**Describe what a vaccination is and explain how they protect from infection** A vaccination involves a **dead or inactive pathogen** being injected into the person. This produces an immune response. The antigen on the vaccine stimulates the white blood cells to start making antibodies. The white blood cells **produce antibodies more rapidly** which leads to the pathogen being destroyed
Model answer	**Explain what antibiotics are and why they can't be used to treat viral infections.** Antibiotics are drugs that are used to treat bacterial infections, they work by damaging tthe bacterial cell without harming your opwn cells. They can't be used to treat viral infection as viruses are found within body cells, because antibiotics don't damage body cells they don't work
Model answer	**Describe and explain the process of developing new drugs.** The first stage involves pre-clinical trials of the new drug on cells, tissues and live animals this is done to test **toxicity, dosage and efficacy**. Next the drug moves onto clinical trials in which the drug is tested on healthy volunteers and then patients at very l**ow doses to check for safety and side effects**. Finally the trial will be carried out on patients to find the **optimum dosage and test efficacy**.This involves the use of **double blind trials** in which patients are randomaly allocated into two groups, one group is given the drug and the other group is given a **placebo** which does not contain the drug. The drug is tested double blind which means that the patients and the doctor do not know who has been given the drug and who has been given the placebo to **remove bias**. Finally there is a **peer review** of data to help prevent false claims
Practice	1. Learn and practice the model answer above

2. How to approach 6 mark questions in Science - Atomic Structure

Question	Explain the arrangement of the first 20 elements in todays periodic table. Identify and explain the changes that Mendeleev made to the periodic table. Explain why Mendeleev's periodic table was accepted over time
Info	At least one of these questions is likely to come up. The examiner is going to be looking for a clear answer written in logical sequence
Top tip	Be careful that you use key words/phrases accurately (these are in bold in your model answers below)
Model answer	**Explain the arrangement of the first 20 elements in todays periodic table.** The elements are arranged in order of their **atomic number**. Elements in the same group have the **same number of electrons** in their **outermost shell**
Model answer	**Identify and explain the changes that Mendeleev made to the periodic table.** Mendeleev **left gaps** for the discovery of new elements. He also rearranged the position of some of the elements so that the properties fitted other elements in the same group
Model answer	**Explain why Mendeleev's periodic table was accepted over time.** New elements were discovered that fitted into the gaps that Mendeleev had predicted. Also, when the neutron was discovered, this led to an understanding of isotopes which explained why Mendeleev needed to swap position of some elements
Practice	1. Learn and practice the model answers above

Year 9 Learning Cycle 1 Science - Clubs and Reading

1. Science reading opportunities

Reciprocal Reading
The Fab 5

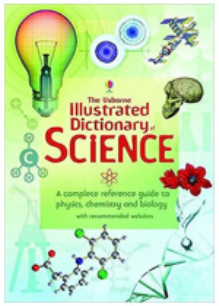
PREDICT
I think... I predict...
I wonder...
I imagine... I suppose...

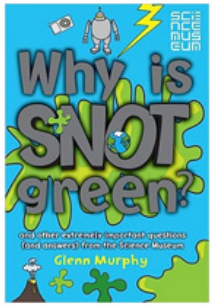
QUESTION
I wonder... Who? What? Where?
When? Why? How? What if?
What does?

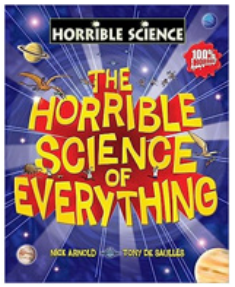
CLARIFY
I'm not sure of this word... section... image...
diagram... label...
what does this mean?
I think I recognise this word...
does it link to... can I have help with a synonym...

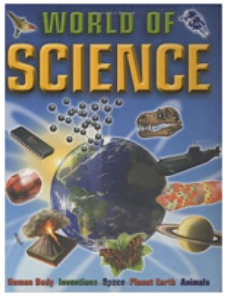
TALK THE TEXT
Why is this text important?
How does it link to my learning?
What key information can
I take from the text?

SUMMARISE
Label the key points / Paragraphs...
bullet point key ideas...
highlight key words...
The most important part is...
next... also... finally...



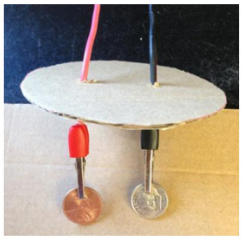






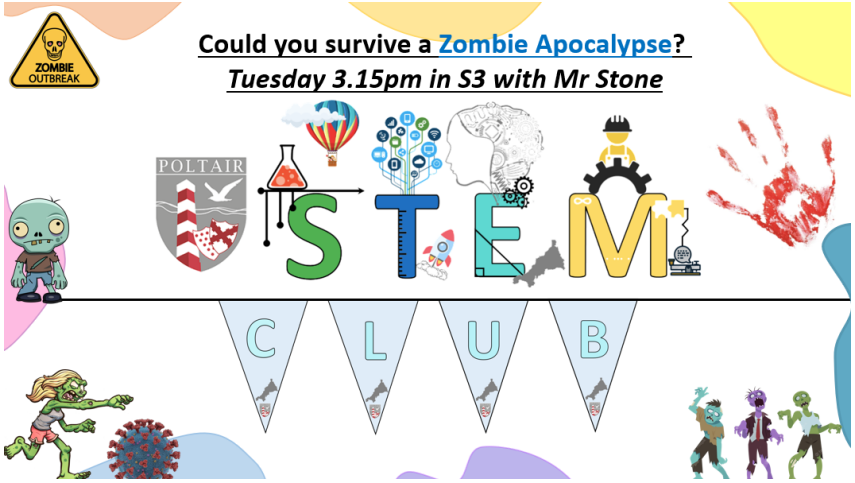
2. Young scientists club

Science or magic?



Miss Freestone and Miss Millward
S6
Wednesdays 3.15pm

3. STEM club



4. Science discovery Websites

Spectacular Science National Geographic

https://kids.nationalgeographic.com/videos/topic/spectacular-science

KS3 Science Bitesize

https://www.bbc.co.uk/bitesize/subjects/zng4d2p

Science Experiments for Kids

https://www.science-sparks.com/

Discover Natural History Museum

https://www.nhm.ac.uk/discover.html

Cornwall Wildlife Trust

https://www.cornwallwildlifetrust.org.uk/

Eden at home

https://www.edenproject.com/learn/eden-at-home

NASA

https://www.nasa.gov/

Year 9 Learning Cycle 1 Geography - Do we live in an equal world

1. Comparing lives

2. Development Indicators

Sustainable Development	Development that meets the needs of the present without affecting future generations
Adult literacy rate (%)	The percentage of people that can read and write
Infant mortality	The average number of deaths of children under 1 year old per 1000 live births
GDP	The total value of goods and services produced by its total population
Life expectancy (years)	The average number of years a person born in a country might be expected to live
Birth rate	The number of live births per 1000 people per year

3. Development Indicators

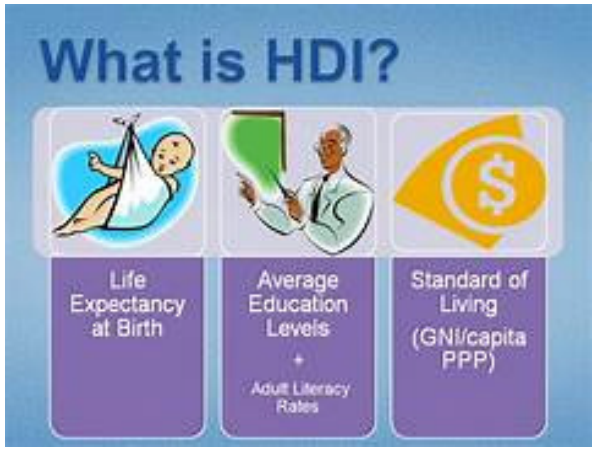
Indicators	Canada	Japan	Peru	Zaire
Annual income per person (in $US)	11100	15760	160	130
Life expectancy at birth	76	78	51	47
Daily calorie supply per person	3326	2846	1927	1749
Adult literacy rate (%)	99	99	68	34

4. Gross National Income

GNI per capita is the total value of all the goods and services produced in a country in a year plus income from abroad, divided by the number of people (per capita) living in that country.

GNI per capita allows us to compare wealth between different countries. However, the calculation only tells us the average income within a country. The wealth of the country may not be shared out equally. Some people may earn a lot of money, whereas others may have very little.

5. Human Development Index



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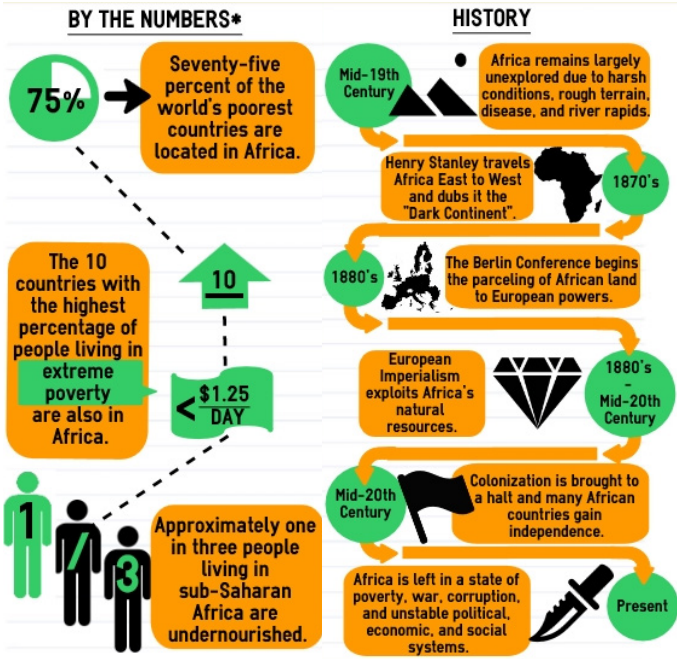
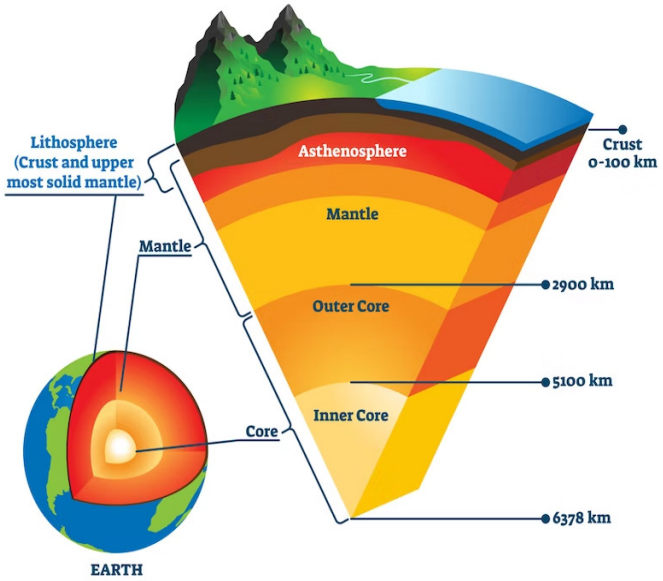
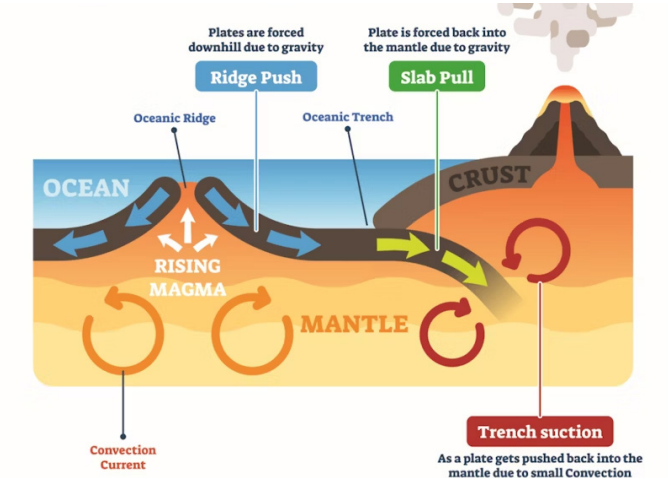


Year 9 Learning Cycle 1 Geography - What power do earth movements have

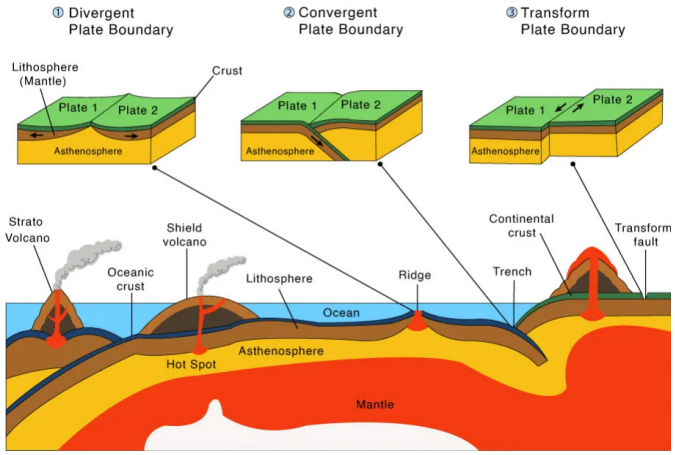
1. Layers of Earth



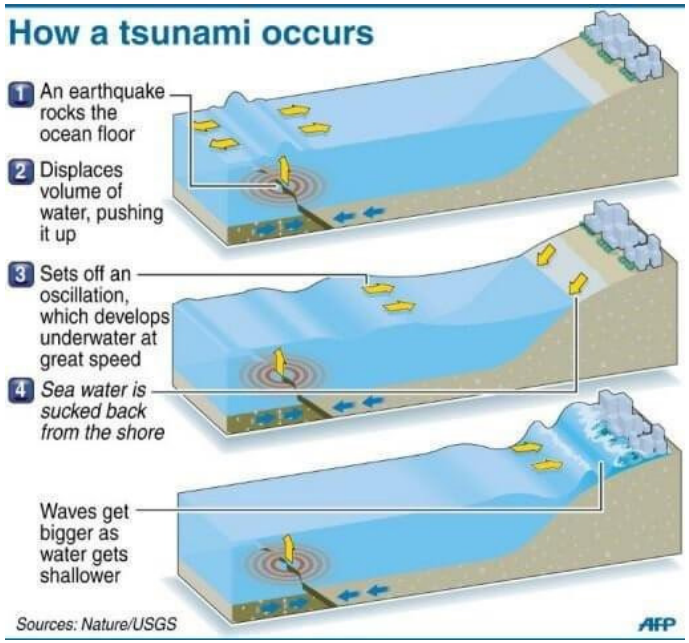
2. Mantle Convection



3. Plate Boundaries



4. How a tsunami occurs



5 Pros and cons of life near tectonic hazards

Farming	Lava breaks down to give very fertile soil
Tourism	Money to be made out of foreign visitors. Hotels etc.
Minerals	Volcanoes are mined for pumice, borax and sulphur. Gold, silver, lead & copper are found in extinct volcanoes.
Energy	Geothermal energy can be generated from the hot rocks! Over 70% of Icelandic homes use this energy.
Hot springs	Can be used for bathing and heating.

Eruption	Numerous effects from direct consequences to long-term issues
Insurance	Difficulty of obtaining
Uncertainty	Difficulty of planning for future.
Wildlife	Volcanoes cause huge loss of wildlife trees and plants
Effects	Gases. Ash. Pyro-clastic flows. Mud-flows. Loss of life

6. 3 P's

	Earthquakes	Volcanoes
Monitoring & Prediction	Seismometers, lasers and GPS receivers can detect or measure movements in the ground. Scientists can monitor the movement of tectonic plates to make predictions and provide vital warnings.	Scientists closely monitor volcanic activity such as land bulges, tremors, sulphuric gas emissions and water temperatures to make predictions. Identifying these warning signs early gives people time to evacuate.
Protection	Earthquake-resistant buildings and infrastructure can be built and existing buildings strengthened (mitigation). Nuclear power stations can use shut-down mechanisms for added protection. When an earthquake occurs, strong furniture, such as desks and tables, can be used as overhead protection.	Protecting against volcanoes is extremely difficult, and the priority is always to evacuate. Other protective measures include shutting windows and doors to block out ash and creating lava diversion channels. Also, people should avoid low-lying areas because of the risk of mudflows (lahars).
Planning	Evacuation plans should be made to get people out of danger as quickly as possible. Emergency aid supplies can be prepared in advance, and emergency services can be given specialist training. People can be educated on what to do in the event of an earthquake or eruption. Building in high-risk areas can be banned.	

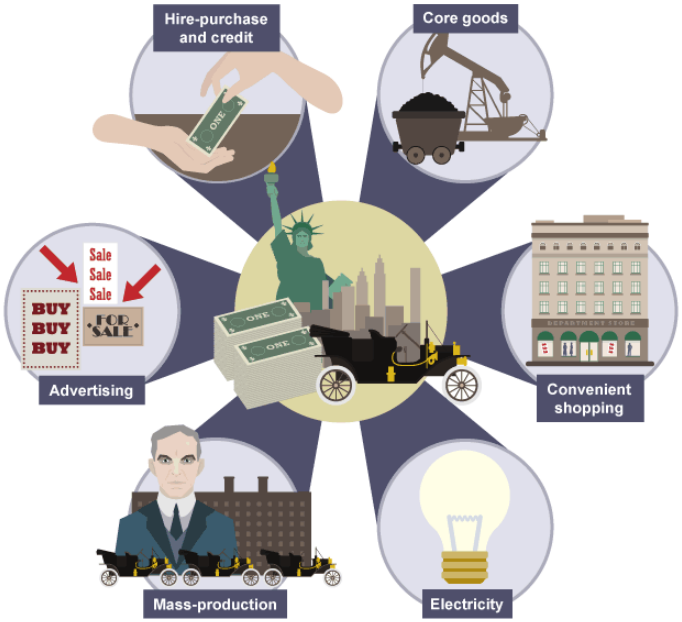
Year 9 Learning Cycle 1 History - What was life like for Americans in the 1920's and 1930s?

1. Key Terms	Description
Boom	A time period where the economy of a country develops quickly and many people become richer
Buying on the margin	Borrowing money to buy shares on the stock market
Capitalism	A system under which businesses are owned privately and people can make a profit
Communism	A theory that society should be completely equal, with all businesses and land owned by everyone equally
Consumer Goods	Things you can buy that are not essential to living- a radio or a vacuum cleaner for example
Depression	When a country's economy declines, leading to high unemployment
Mechanisation	Using machines in factories to make things
Stock Market	The place where stocks and shares (a small part of a company) are bought and sold
Wall Street	A street in New York where the stock market is based

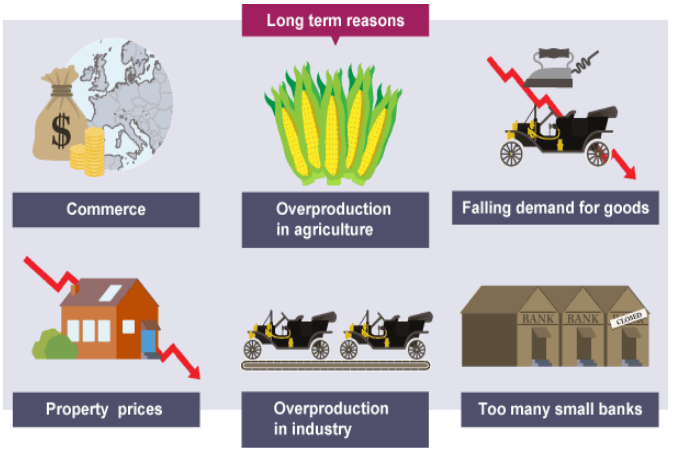
2. Flappers

Flappers were a subculture of young Western women in the 1920s who wore short skirts (knee height was considered short during that period), bobbed their hair, listened to jazz, and did not behave in a way considered appropriate.

3. Reasons for the boom



4. Reasons for the Wall Street Crash



Above are reasons for the Wall Street Crash.

Commerce is trade around the world

Overproduction is too much being made or grown

Overspeculation is too many people trying to get rich on the stock market and taking big risks that they could not afford.

Year 9 Learning Cycle 1 History - What did the Industrial Revolution mean for Britain?

Thinking Like a historian

Source Type	Use?
Newspapers	Report on daily events and show public opinion. They can be really useful for getting a 'feeling' of the time and what people were thinking about certain events
Diaries and letters	These are very personal to those writing them. People would share views, ideas and emotions that they may not say out loud to others, so it gives us a real 'insider' view on what people really thought or felt
Original Photographs	These capture a snapshot of the past. They obviously are only useful for the exact moment and not the before or after, but they can be useful for showing the exact view of an event/person/place etc
Statistics	Statistics are great for giving us specific data on a 'bigger picture' of something. E.g. How many people died during a battle or the number of people working in certain professions etc
Government reports	These are usually confidential when they are created so they should give us a true reflection of how the government thought about a particular issue and their reasons for doing something
Original Paintings/ drawings/ sketches	These can be useful to show us attitudes about people at the time; e.g. cartoons drawn about events or issues like those that might end up in the newspaper. They are also useful to show us how people like Queen Elizabeth I wanted to be viewed and even just what they looked like. They are even useful to show us what an event like a key battle might have looked like at a time when there was no photography (think Battle of Hastings, events in the English Civil War etc.)

Thinking Like a historian

Source Key Word	What is it?
Nature	The type of source; report, newspaper, diary, painting etc
Origin	Where the source comes from; Who created it? When was it created?
Purpose	Why the source was created; to inform, to share personal views, to record facts etc
Provenance	This just means the NOP (nature, origin, purpose) of a source. As historians we look at these things to work out how useful a source is for our enquiry

Year 9 Learning Cycle 1 History - Was the Holocaust an intentional act?

1. Key Terms	Description
Anti Semitism	The hatred and persecution of Jewish people. It is not something that only happened in Nazi Germany- sadly it has a long and difficult history
Aryan	Nazi Term for a non-Jewish German
Concentration Camp	Prison for political prisoners or people targeted by the Nazis
Gestapo	Nazi secret police
Roma and Sinti peoples	A more specific term for Gypsy Travellers targeted by the Nazi Regime
Scapegoat	A person or group made to take the blame for others
Holocaust	The Holocaust was the state-sponsored persecution and mass murder of millions of European Jewish people, Roma and Sinti peoples, the disabled, political opponents and members of the LGBT+ community by the German Nazi regime between 1933 and 1945
Shoah	Many people use this term instead of Holocaust. It is Hebrew and means catastrophe

2 .Hitler's Persecution of the Jews

Hitler used Jewish people as scapegoats for Germany's problems and attacks on them increased during the Nazi Period. Many attacks and limits on how Jewish people took place, including:

April 1st 1933: Hitler's first action directly against the Jews was a Boycott of all Jewish Businesses

May 10th, 1933: Burning of books in Berlin and throughout Germany.

September 15th 1935: The Nuremberg Laws were passed taking away citizenship and basic rights of Jewish Germans

November 9th 1938: Kristallnacht, or Night of the Broken Glass. An attack on Jewish businesses, homes and synagogues across Germany. Over 100 Jewish people were killed, and over 20,000 were sent to concentration camps.

Year 9 Learning Cycle 1 Spanish

1. Know your phonics!

Revisit these rules and then apply them to all new vocabulary that we cover this term. Remember the rules never change!

a - e - i - o - u

ca - ce - ci - co - cu

ca - que - qui - co - cu

ga - ge - gi - go - gu

ga - gue - gui - go - gu

rr - ll - v - h - j - ñ - z

Pronouncing words in Spanish:

https://www.bbc.co.uk/bitesize/topics/zhy27nb/articles/zk78382

SCAN ME

2. Know your question words!

To answer any question, it's essential you know your key question words well. These are all on Memrise as well for you to practise.

qué = what

cuál = which

dónde = where

adónde = where to

de dónde = where from

cuándo = when

quién = who

con quién = with whom

por qué = why

cuánto = how much

cuántos = how many

cómo = how

cómo es = what like

3. Vocab learning techniques

Your Knowledge Organiser includes all the topic specific vocabulary for this unit, this is also accessible on Memrise.

To effectively learn vocabulary, practise the suggestions below. What technique works best for you?

1. Look-cover-write-check This video demonstrates what to do: https://youtu.be/YFEzhGnJP_Q

2. Make Flashcards: https://youtu.be/-SL9037YMKA

4. Conversational Spanish

Can you answer these questions? Use your Knowledge Organiser for support:

¿Cuántas personas hay en tu familia?

¿Cómo es tu madre/padre/hermano etc.?

¿Puedes describir tu familia/ madre/ padre etc.?

¿Cuándo es tu cumpleaños?

¿Te llevas bien con tu familia/madre/ padre etc.?

¿Cómo eras de joven?

5. High frequency Vocabulary

This vocab is commonly used all the time in Spain, the more of this you know, the better you will be able to communicate in any situation:

me llevo bien= I get on well

puede ser = he/she can be

más...que = more...than

menos...que = less...than

siempre = always

nunca = never

a veces = sometimes

dado que

puesto que

ya que

} because

6. Further Reading

At the end of term, we will be completing a written assessment – these websites will help you prepare for this:

Pronouncing words in Spanish:

https://www.bbc.co.uk/bitesize/topics/zhy27nb/articles/zk78382

Talking about family and pets in Spanish:

https://www.bbc.co.uk/bitesize/topics/zfgt6v4/articles/zfryxyc

Describing people using tener and ser:

https://www.bbc.co.uk/bitesize/topics/zfgt6v4/articles/zkmwgwx

How to use adjectives and make comparisons:

https://www.bbc.co.uk/bitesize/topics/zg9mhyc/articles/zjdrvk7

How to form the present tense:

https://www.bbc.co.uk/bitesize/topics/zg9mhyc/articles/z63n7nb

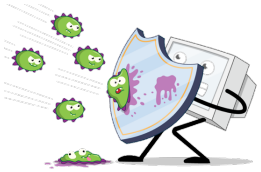
Year 9 Learning Cycle 1 Computing - Cyber Security & Social Engineering

1. Key Terms	Description
Virus	Viruses are a malicious form of self-replicating software. Once on a computer or network, a virus will replicate itself by maliciously modifying other computer programs and inserting code
Worms	replicate themselves but do not attach themselves to files as a virus does. Instead, worms spread through the network and use the system's resources
Trojan	A trojan is a piece of software that appears to perform a useful function (such as a game) but it also performs malicious actions
Spyware	Spyware is unwanted software that monitors and gathers information on a person and how they use their computer
Ransomware	This is a form of virus, as it is self-replicating. Ransomware locks a computer, encrypts files, and therefore prevents the user from being able to access the data
Malware	Malware (malicious software) is software that is designed to gain access to your computer with malicious intent

2. There are lots of technical ways to try and keep data safe and secure from attacks:

Human error creates the largest risk of the data being compromised.

Social engineering is a set of methods used by cybercriminals to deceive individuals into handing over information that they can use for fraudulent purposes



3.

Name generator attacks

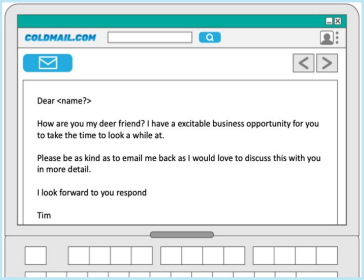
These are attacks in which the victim is asked in an app or a social media post to combine a few pieces of information or complete a short quiz to produce a name.

Attackers do this to find out key pieces of information that can help them to answer the security questions that protect people's accounts.

Blagging

Blagging (also known as **pretexting**) is an attack in which the perpetrator invents a scenario in order to convince the victim to give them data or money.

This attack often requires the attacker to maintain a conversation with the victim until they are persuaded to give up whatever the attacker asked for.



Shouldering

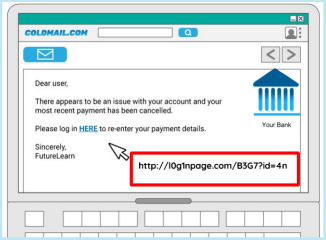
Shouldering (also known as **shoulder surfing**) is an attack designed to steal a victim's password or other sensitive data.

It involves the attacker watching the victim while they provide sensitive information, for example, over their shoulder. This type of attack might be familiar; it is often used to find out someone's PIN at a cash machine.

Phishing

A **phishing attack** is an attack in which the victim receives an email disguised to look as if it has come from a reputable source, in order to trick them into giving up valuable data.

The email usually provides a link to another website where the information can be inputted.



Sending similar messages by SMS is known as **smishing**.

Year 9 Learning Cycle 1 Computing - Python Programming

1. Key Terms	Description
sequence	In programming, statements are executed one after another. Sequence is the order in which the statements are executed.
function	A section of code that, when programming, can be called by another part of the program with the purpose of returning one single value
data type	In computer programming, data is divided up and organised according to type, eg numbers, characters and Boolean.

An **algorithm** is a set of **precise** instructions, expressed in some sort of **language** (e.g. textual, visual).

Understanding the language is necessary in order to **execute** the instructions.

Executing these instructions is meant to solve a **problem**.

A **program** is a set of precise instructions, expressed in a **programming language**.

Translating the programming language is necessary for a machine to be able to **execute** the instructions.

Use == to check if something is the same (equivalent)

Use = to change a variable to a new value (assignment)

2. Sequence

print displays the words in "...." on the screen

A variable is a named memory address that holds a value. The value held in a variable can change

```
print("Year of birth?")
birth_year = input()
age = 2020 - birth_year
print("You are", age, "years old")
```

input() waits for the user to type something

Operators can be used to change data, eg 2020 – the age you entered

3. Functions / subroutines

```
def calc_area(h,w):
    area_out = h * w
    return area_out

height_in = int(input("Enter height: "))
width_in = int(input("Enter width:"))
print("The area is ", calc_area(height_in,width_in))
```

This function multiplies two inputs and returns the value

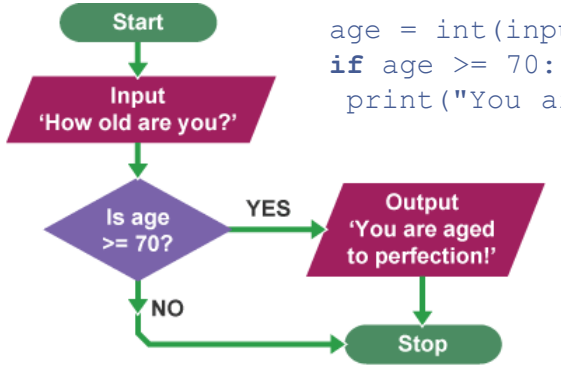
The function is used later in the code

Year 9 Learning Cycle 1 Computing - Python Programming

1. Binary Digits

Key Words	Definitions
Bug	An error in a program
Comments	Adding one or more sentences to explain the purpose of a section of code, use # at start of comment.
Python	A high-level coding language
IDLE	Integrated Development and Learning Environment
Iteration	A part of the code that repeats
Logic Error	A fault in the logic or structure of the problem which means it doesn't produce the output expected
Syntax Error	An error in a programming language caused by not using the correct syntax. These are normally spelling errors or small grammatical mistakes
Sequence	a set of instructions that follow on one from another
Variable	A memory location within a computer program where values are stored. The value can be changed during the program

2. Using Selection




```
age = int(input("How old are you?"))
if age >= 70:
 print("You are aged to perfection!")
```

Selection uses **if** statements
Elsif can be added for other conditions

3. Using Iteration

While Loops

condition-controlled

```
total = 0
answer = "yes"
while answer == "yes":
    number = int(input("Type in a number: "))
    total = total + number
    answer = input("Any more numbers? yes/no ")
print("The total is: ")
print(total)
```

For Loops

count-controlled

```
total = 0
for count in range(5):
    number = int(input("Type in a number: "))
    total = total + number
print("The total is: ")
print(total)
```

Year 9 Learning Cycle 1 Computing - Networks

1. Python Lists

Lists are used to store multiple items in a single variable

```
thislist = ["House", "Cottage", "Flat"]
print(thislist)
```

Values in a list are numbered from 0. This code will output "Flat"

```
thislist = ["House", "Cottage", "Flat"]
print(thislist[2])
```

List items are ordered, changeable, and allow duplicate values

2. Python Strings

A string is sequence of characters often stored as a variable in a computer program. These characters can include numbers, letters and symbols.

Display the string using the print() function:

```
greeting = "Hello"
print(greeting)
```

Display the length of the string by adding the len() function:

```
greeting = "Hello"
print(len(greeting))
```

3. Networks

1. Key Terms	Description
Network	A group of connected computers or devices
Internet	A global network of computers. All computer devices (including PCs, laptops, games consoles and smartphones) that are connected to the internet form part of this network.
Websites	Websites consist of webpages which allow you to see information. Websites are accessed using a web browser.
World Wide Web (WWW)	The part of the internet that can be accessed through websites.
WAN	Wide Area Network (eg. the internet)
LAN	Local Area Network (eg. The school)
PAN	Personal area Network (eg Bluetooth)

Year 9 Learning Cycle 1 Computing - HTML

1. Key Terms	Description

HTML	HyperText Markup Language. The language used to write and display web page documents.
	HTML can be written with specialist software or using a text editor, but must be saved with the extension .html
	This is an example of html
	`<html>`
	`<body>`
	`<h1>Hello world</h1>`
	`<p>This is my first webpage</p>`
	`</body>`
	`</html>`

HTTP	Hypertext Transfer Protocol - a request/response standard. Web browsers send requests and websites or servers respond to requests
Hyperlink	A link in a document or webpage that connects to another location
Network	A group of interconnected computers/devices.
Internet	A global, partial mesh network
WAN	Wide area network

2. CSS

Cascading Style Sheets

Cascading Style Sheets (CSS) can be used to style web pages. While HTML tells the browser what to display on a page, CSS tells the browser how to display it. CSS rules can be added to already existing HTML files.

A CSS rule set consists of:

a selector – what the rule is for

a declaration block – what the rule will do

Change background colour of the body to ivory	`body {`
	`  background-color:ivory;`
	`}`

Set the format of the header to blue and font size to 12 pixels	`h1 {`
	`  color: blue;`
	`  font-size: 12px;`
	`}`

Year 9 Learning Cycle 1 Computing - Networks

3. How are Images represented in Computers?

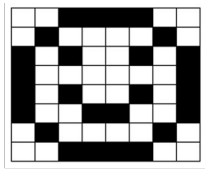
Images are stored in binary

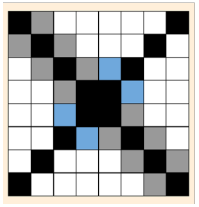
- A binary number is allocated to each colour in the image.
- The size of an image file depends on the number of bits used for each colour (as well as the file height and width).

1 bit = two possible colours (black and white)

The more bits, the more colours you can use in your image.

So 2 bits = 4 colours, 4 bits = 16 colours





11	10	00	00	00	00	00	11
10	11	10	00	00	00	11	00
00	10	11	10	01	11	00	00
00	00	10	11	11	01	00	00
00	00	01	11	11	10	00	00
00	00	11	01	10	11	10	00
00	11	00	00	00	10	11	10
11	00	00	00	00	00	10	11

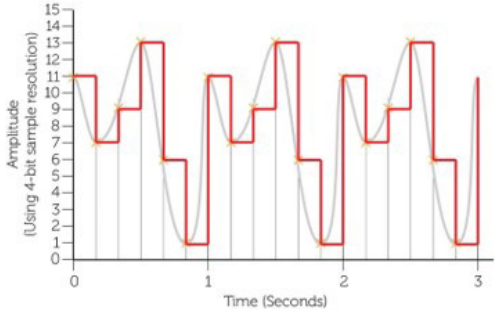
Colour depth	The number of bits determines the range of colours. More bits = more colours in an image. More bits = larger file size
Image size	the number of pixels that an image contains. It is expressed as height and width in mm
Image file size	Calculated by multiplying: Colour depth (bits) x Height (pixels) x width (pixels)
resolution	Images are made up of pixels. The density of pixels is called resolution. Files with higher resolution are have larger file size but can also be dislpayed at a larger size without loss of detail
Metadata	Information which is stored with the image, such as when it was taken, file size, bit depth

4. How is sound represented in computers?

Sound is stored in binary

An analogue sound wave is converted to digital using a technique called sampling

The sound wave is sampled and the amplitude measured is stored as a binary number.



bit	The smallest unit of data in computing represented by a 1 or 0 in binary
Bit depth	The number of bits available to store an audio sample
Bit rate	The number of bits processed per second
sample	A digitally recorded fragment of sound, taken from an existing track or sound environment

Calculating sound file size:

Bit rate x bit depth x time (seconds)

Year 9 Learning Cycle 1 Art

1. Tier Three Vocabulary

Key Words	Definitions
Western Front	An area of northern France and Belgium with the most fighting during the First World War
Tommy	Nickname given to the British soldiers
Artillery	Heavy guns back from the front line
Home Front	The activities and lives of the people left at home
Trench	Soldiers dig down into the earth from between a few centimetres and 6' to provide protection from the enemy artillery
Shell Hole	When a shell (bomb) falls onto the earth it causes an explosion which throws earth into the air
Munitions	Factories where ammunition, guns, shells, tank and bombs were made by women

2. Different Materials/Medium

You will develop your drawing skills to create a pattern design that will be inspired by natural forms and used to learn how to lino print and reduction lino printing. You will learn how to create a repeat pattern.

3. What is empathy

You will learn to look, understand and empathise with the soldiers, parents, children, brothers, sisters, women and workers on both sides of the war. You will research, think and develop an outcome that explores the impact of the Great War.

Art can be a form of therapy, promoting us to reflect on the meaning of life. What happens when we stand in front of a work of art? How might it affect us? What can we learn about ourselves by contemplating it? Art has sometimes been used by political powers to create propaganda. Art can be a way to speak truth to power.

4. Artists that make Marks

CWR Nevinson

Nevinson was a studying at Slade Art school London before signing up to the Artist Rifles and serving on the Western Front.

Paul Nash

Nash was a studying at Slade Art school London before signing up to the Artist Rifles and serving on the Western Front

Winifred Knights

Knights was studying at Slade in London before the war. She witnessed the Siler Town explosion and it left her with trauma.

5. Links and Further Reading

is.gd/imperialwar

is.gd/christophernevinson

is.gd/tatemodern

is.gd/paulnash

Year 9 Learning Cycle 1 Design Technology - Rockets

1. Key Words	Definitions
Specification	Details of a product's required characteristics, and all the processes, materials and other information needed to design the product
Aesthetics	How your product looks
Finish	A protective or decorative layer added to a product such as varnish or paint
Crosscut Saw	A saw with a blade designed for cutting across the grain of the wood
Tenon Saw	A saw with a stiffener along the top edge to keep the blade straight
Disc Sander	A machine used to shape the ends and edges of shapes in timber or plastics
Fastenings	Components used to join pieces together
PVA Wood Glue	Polyvinyl acetate is a water-based adhesive. PVA works when it soaks into the surface of the wood and sets once all the water is absorbed
Secure	Safe from being accessed by unauthorised people

2. Sustainability

Think about the materials that you use to construct your security box:

- Wood is a sustainable resource because it can be replaced at a similar rate to its use. As 1 tree is chopped down, many more can be planted to ensure the use of trees can be sustained.
- Polymers (plastics) are often formed from crude oil, which is finite, so using polymers can be less sustainable.

3. Types of lock

Padlock	A portable lock usually with a shackle that may be passed through an opening. Opened using a key. Advantages: Doesn't need power. Disadvantages: Easy to pick. Keys could be lost/stolen
Electronic Lock	A locking device which operates by means of electric current. Opened using a code or authorisation card. Advantages: No need to carry keys Easy to change the access code Disadvantages: Expensive and requires power
Combination Lock	A type of padlock that doesn't need a key. Opened using a combination. Advantages: Doesn't need power. Disadvantages: Large.
Magnetic Lock	A type of lock where a magnet is used to slide a latch open

4. Workshop Safety

1. Leave your bags in the bag space so that people don't trip over them.
2. Never run in a workshop.
3. Don't play with the vice on the workbench as it can easily pinch your skin.
4. Tell the teacher if there is sawdust/metal filings on your workbench – Don't blow them or brush them with your hand.
5. Don't touch tools without permission from the teacher.

5. ACCESSFM

We use ACCESSFM to help us to create a specification:

6. Links and further reading

ACCESSFM:

https://www.youtube.com/watch?v=EMh8XLD-bOM

Timber and Polymer materials

https://www.bbc.co.uk/bitesize/guides/zkvny4j/revision/1

https://www.bbc.co.uk/bitesize/guides/zrstng8/revision/1

Revise:

Mindmap Makeris.gd/mindmapmaker

Year 9 Learning Cycle 1 Food - Legislation and Labels

1. Key Terms	Description
Legislation	Rules or laws made by the government to ensure food is produced, handled, and sold safely
Environmental Health Officer (EHO)	A person who works for the government to make sure that businesses follow the rules and regulations for food safety and hygiene
Cross-contamination	When germs or harmful substances from one food item spread to another, making it unsafe to eat
Coeliac	A person who has a condition where their body cannot tolerate gluten
Lactose Intolerant	A person who has difficulty digesting lactose, a sugar found in milk and dairy products, which can cause stomach pain and discomfort
Shortening	A person who has difficulty digesting lactose, a sugar found in milk and dairy products, which can cause stomach pain and discomfort
Plasticity	The ability of a material, like butter or dough, to be easily moulded or shaped
Allergy	When a person's immune system reacts strongly to certain foods, causing symptoms like hives, difficulty breathing, or swelling
Intolerance	When a person has difficulty digesting or processing certain foods, leading to symptoms like stomach discomfort or diarrhoea
Seasonality	The idea that certain foods are best and most abundant during specific times of the year, like strawberries in the summer or pumpkins in the fall

2. EHO Roles and Responsibilities

The EHO's (or Environmental Health Officer) main job is to ensure that every food business runs up to code and that public health and the environment are protected from harm. An Environmental Health Officer (EHO) is a food safety professional tasked with implementing and ensuring food safety laws.

You will see these signs in every place that sells food to the public.

EHO Roles:

3. Labelling

The following eight pieces of information MUST appear BY LAW on food labels:

1. NAME OF FOOD/DRINIK
2. LIST OF INGREDIENTS (INCLUDING ADDITIVES AND ALLERGENS)
3. WEIGHT OR VOLUME
4. DATE MARK
5. STORAGE AND PREPARATION CONDITIONS
6. NAME AND ADDRESS OF THE MANUFACTURER, PACKER OR SELLER
7. COUNTRY OF ORIGIN AND PLACE OF PROVENANCE
8. NUTRITION INFORMATION

INGREDIENTS

Water, Carrots, Onions, Red Lentils (4.5%) Potatoes, Cauliflower, Leeks, Peas, Cornflower, **Wheat** flour, Cream (**milk**), Yeast Extract, Concentrated Tomato Paste, Garlic, Sugar, **Celery** Seed, Sunflower Oil, Herb and Spice, White Pepper, Parsley

ALLERGY ADVICE

For allergens, see ingredients in **bold**

4. Skills

Stuffing	The skill of filling ingredients, such as meats or vegetables, with a seasoned mixture.
Enrobing	The technique of coating one ingredient, usually in chocolate or batter, to create a smooth and even outer layer.
Rubbing-In	The process of combining fat, such as butter, with dry ingredients, like flour, by rubbing them together until the mixture resembles breadcrumbs.
Rolling	The action of using a rolling pin to flatten dough or pastry into a desired thickness or shape.
Shaping	The skill of forming ingredients, such as dough or meat, into specific shapes or forms, often using hands or utensils.
Whisking	The act of vigorously mixing ingredients together using a whisk, typically to incorporate air or create a smooth consistency.
Baking	The method of cooking food in an oven using dry heat, resulting in the browning, rising, and cooking of the ingredients.
Kneading	The process of working dough by folding, pressing, and stretching it to develop gluten and create elasticity.
Proving	Allowing dough to rise and ferment in a warm place, often in a covered bowl, to encourage yeast activity and achieve a lighter texture when baked.

6. Links and Further Reading

TEDTalk: How the Food You Eat Affects Your Brian

https://youtu.be/xyQY8a-ng6g

Article:Nutrition needs when you're over 65

https://is.gd/elderlydiet

Revise:Mindmap Maker

is.gd/mindmapmaker

Year 9 Learning Cycle 1 RE - Why is there suffering?

1. Key Words	Definitions
Philosophy	The religious faith of Muslims including belief in Allah as the sole god and in Muhammad as his prophet
Free Will	Muhammad was the founder of Islam and according to Islam he was the prophet and God's messenger
Absolute morality	The Qur'an is the holy book for the Muslims, revealed in stages to the Prophet Muhammad over 23 years
Relative morality	The mosque is a place to gather for prayers, to study and celebrate festivals such as Ramadan
Moral evil	Muslims believe made everything, knows everything and is all-powerful, so human beings must worship him
Natural evil	the Hajj is the journey that every adult Muslim must undertake at least once in their lives if they can afford it and are physically able
Omnipotence	Muslims give up food, liquid and smoking between the hours of daylight for 29 or 30 days of Ramadan
Omnibenevolence	A prophet is an individual regarded as being in contact with god and said to speak on their behalf
Omniscience	Fasting is the willing stop or reduction from some or all food, drink, or both, for a period of time
Dukka	The Kaaba is built around a sacred black stone, a meteorite that Muslims believe is a symbol of God's covenant

SCAN ME

Use this QR code to watch different opinions and perspectives on suffering

2. Key stories to explain suffering in Christianity

The Book of Job (1: 8–12 and 42:1–6)

The Bible tells the story of a man called Job who is described as a good man who loves God. Satan challenges God, saying that Job is only good because he has a happy life. God allows Satan to put Job's faith to the test by causing him to suffer.

First, Job loses his livestock, his servants and all his children. He is devastated, but he remains faithful and praises God. Then he suffers horrible weeping sores all over his body. Job's wife tells him to reject God and to accept that he is dying, but Job refuses.

Eventually, God appears to Job. He asks impossible questions that show Job how little he can understand about God's ultimate plan. Job is humbled by this encounter, and at last appreciates that God's unlimited power cannot be fully understood by human beings.

Job never learns why he suffered, but God restores his health and gives him twice as much property as before, more children and a very long and prosperous life.

Genesis 2–3

These chapters of Genesis describe the following events:

- God forms man, known as Adam, out of the dust of the Earth and breathes life into him.
- God then creates the Garden of Eden and places Adam there.
- God creates birds and animals for Adam, and Adam names these.
- God decides to create another human, and so he creates a woman, Eve, out of Adam's rib while Adam is asleep.
- Adam and Eve live an innocent and sinless life in the Garden of Eden until the serpent, which some Christians believe represents Satan, tempts them to eat the fruit God has forbidden them from eating.
- Eve eats the fruit first and then gives some to Adam, meaning they are both banished from the Garden of Eden.
- Eve is punished with the pain of childbirth and Adam is condemned to work hard for his living.

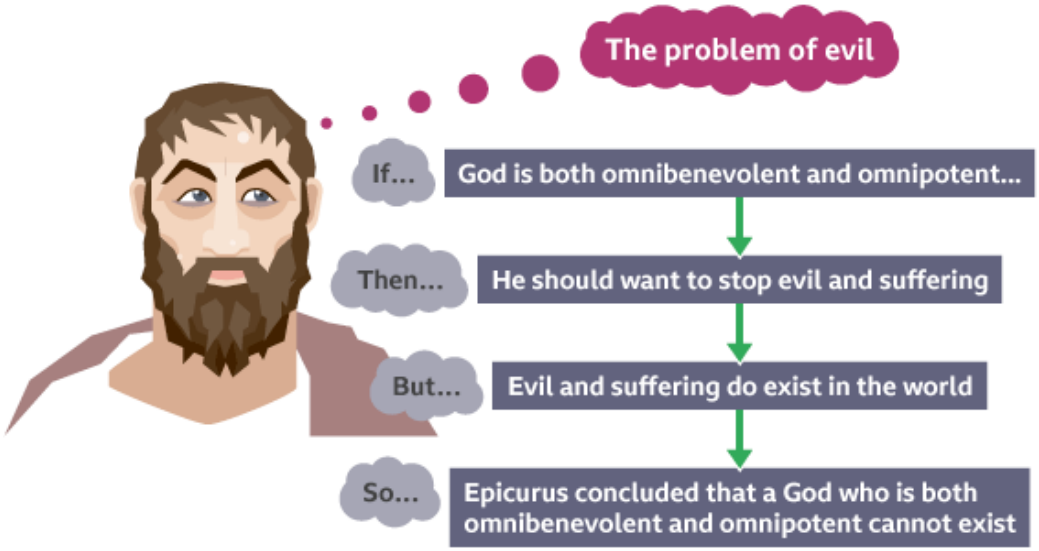
This account is significant as it shows that God has given humans self-knowledge and free will, which means they are capable of choosing between good and evil.

Many modern readers question how Eve is treated and presented and the impact this has had on the role and treatment of women.

Year 9 Learning Cycle 1 RE - Why is there suffering

3. The problem of evil

The ancient Greek philosopher Epicurus (341–270BC) wrote about the contradictions between the characteristics of God and the presence of evil and suffering. He described God as malevolent, meaning 'cruel':



4. Christians have various solutions to the problem of evil and suffering in the world:

God gave humans free will. Therefore, although he exists, he cannot interfere in any suffering that results from choices people have made.

Suffering is not God's fault. Sin entered God's perfect world when the first humans, Adam and Eve, used their free will to turn away from God.

Experiencing bad things is all part of God's plan and humans should respond positively.

Many Christians believe that balance is important – humans need evil to appreciate goodness.

God is fair – people may suffer in their lives on Earth, but good people will be rewarded in Heaven.

5. Buddhism and Suffering

What does Buddhism teach about suffering?

Suffering is a natural part of life. When Siddhartha left the palace in which he lived, the three people he saw were an old man, an ill man and a dead person. This taught him that people suffer in life.

The Four Noble Truths are a summary of the Buddha's teachings. It is these truths that the Buddha taught to his first disciples after he was enlightened.

- Dukkha - the truth of suffering.
- Samudaya - the truth of the origin of suffering.
- Nirodha - the truth of the cessation (end) of suffering.
- Magga - the truth of the path to the cessation (end) of suffering.

The Buddha taught that the way to get rid of the desire that causes suffering is to free yourself from being attached to it. The Eightfold Path is a set of guidelines for Buddhists to live by that should lead to the end of suffering.

Each step of the Eightfold Path is carried out at the same time, as opposed to step by step. The eight steps are:

Right Understanding
Right Intention
Right Speech
Right Action
Right Livelihood
Right Effort
Right Mindfulness
Right Concentration

Buddhists believe that following the Eightfold Path will help them to reach enlightenment. This will end the cycle of suffering.

Buddhists also believe in karma or 'intentional action'. Buddhists try to perform good actions, eg based in generosity and compassion. They avoid performing bad actions, eg based on greed and hatred.

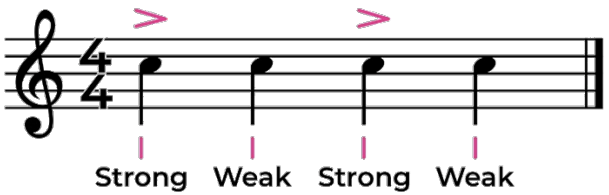
Year 9 Learning Cycle 1 Music - Reggae

1. Key Words	Definitions
Syncopation/ Offbeat	When you emphasise a weak beat in music to create a rhythmic effect
Bass Line	A repeating pattern of low notes in music that forms the foundation of a song's harmony
Backbeat	A strong accent on the second and fourth beats in a bar of music
Consonance	A pleasing combination of sounds in music
Dissonance	An unpleasant combination of sounds in music
Chords	Multiple notes played at the same time in music to create harmony
Rhythm (Riddim)	A pattern of beats in music that creates a groove
Bob Marley & The Wailers	A popular Reggae band from Jamaica with Bob Marley – the most famous Reggae musician – as the lead singer
Vocal Projection	The technique of using your voice to sound loud and clear
Triad	A group of three notes played together in music
Steel Drums/ Steel Pans	A percussion instrument from the Caribbean that is made from metal

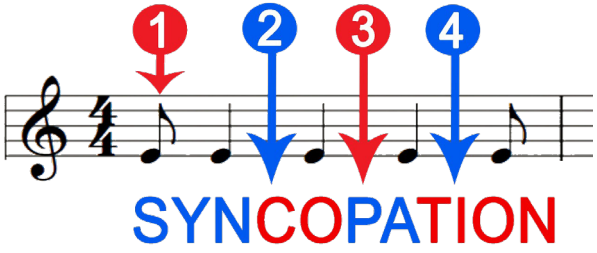
2.Syncopation

Syncopation can be a difficult concept to understand. In music there are stronger beats and weaker beats. Syncopation is where emphasis is placed on a weak beat or an offbeat rather than the strong beat that is expected. For example:

Strong and weak beats in 4/4



Syncopation is shown below – the notes hit in between the main pulse of the music

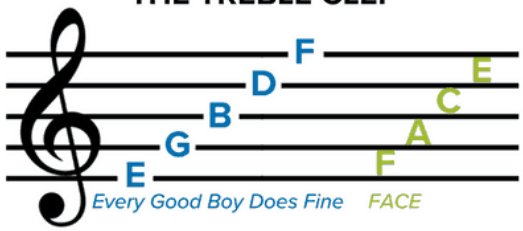


3. How to read pitch notation

We use these mnemonics to help remember how to read music. The Bass Clef is usually played with our left-hand, and the Treble Clef is usually played with our right-hand

THE BASS CLEF

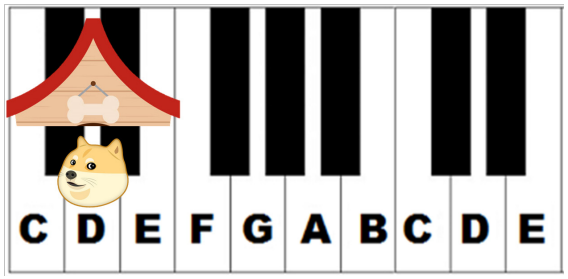
THE TREBLE CLEF



4. How to find notes on a piano

There is an easy method that will help you find notes on a piano/keyboard. All black notes are grouped in twos and threes. If you find the group of two black notes, The D (dog) sits in between the two black notes (kennel).

DOG IN THE KENNEL



5. Links and Further reading

Article:The rise of Reggae: How a uniquely Jamaican sound conquered the world
https://is.gd/historyofreggae

Lesson:Learn Reggae Guitar (Rhythm, Chords, Scales, History, Songs)
https://is.gd/reggaelesson

Revise:Flash Card Maker
is.gd/flashcardmaker

Year 9 Learning Cycle 1 Drama - Interpreting Scripts

1. Key Words	Definitions
Stage Directions	An instruction in the text of a play indicating the movement, position, or tone of an actor, or the sound effects and lighting
Thrust Staging	Staging that extends into the audience on three sides and is connected to the backstage area by its upstage end
Proscenium Staging	The staging in proscenium theatres often implies that the characters performing on stage are in a four-walled environment, with the fourth "wall" open to the audience
In The Round Staging	The acting area, which may be raised or at floor level, is completely surrounded by the audience
Traverse Staging	The audience is on two sides of the stage, facing towards each other- like a catwalk
Tone	The emotional sound of your voice
Pitch	How high or low your voice goes in speech
Facial Expression	How you show emotion on your face
Body Language	How you communicate feeling through the actions of your body
Gait	How your character walks
Gesture	A movement that communicates something

2. Scripts

The written text of a play, TV programme or film is called a script.

Script analysis is a key step in any actor's process.

A close examination of the text can help you develop your character's motivations and backstory to enable you to bring your character in your script to life.

Setting and Script Notes

The script will also give you details about the setting - or settings if a number of scene changes are needed. There could also be information about design, props and costume.

Dialogue

The play will normally be written with character names indicating who speaks which line and in which order. There are plays where this is stated less clearly, leaving more decisions for the director to make, but usually the playwright provides these details.

Stage Directions

Stage directions will be given where the writer has a definite idea of what's required at a particular point. They're also used to make the situation clear when the action, rather than the characters' words, is the vehicle for the plot.

3. Stanislavski

A Russian theatre practitioner who developed a 'system' for actors, born out of a quest for realism in acting.

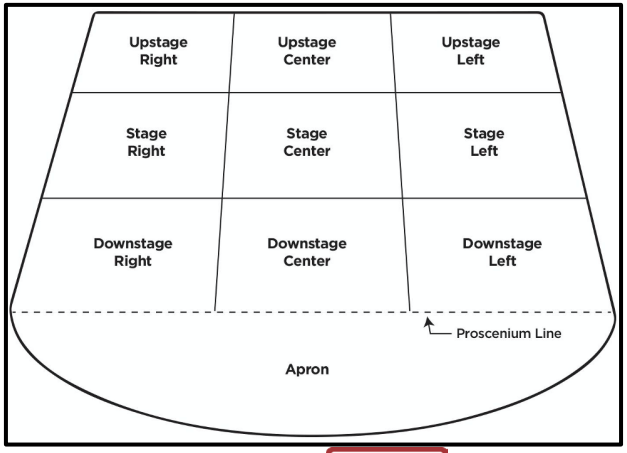
Techniques

Given circumstances- Information about the character you can gather from the script.

Character objective- Considering the reason behind the character's action. What are they trying to achieve?

Magic if- the actor puts themselves into the character's situation, imagining what they would do 'if' this happened to them.

4.



Stanislavski
is.gd/stanislavski

Types of Staging
https://is.gd/typesofstaging

Flashcard Maker
https://is.gd/flashcardmaker

5. Character development

In order for your character to be believable to an audience, you have to do some work to create and develop your character.

Ways to develop a character:

Character profile- Create a backstory for your character. A character profile should include information about your characters' life up until now, which will inform the physical and vocal choices that you make.

Hot seating- Hot-seating involves having a dialogue with a character. The character steps out of the drama for a while, usually sits in an appointed chair (the hot-seat) and is open to questioning by the audience or students. The character must answer in role.

Notes Pages

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