POLTAIR

**Year 8
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

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 Personal Learning Checklist (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

POLTAIR

ATTENDANCE FOCUS
POLTAIR

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 continued, 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	Reading	Sparx Maths XP	Reading	Sparx Maths XP	Reading
Subject 1	Geaography	History	Science	Maths	Spanish
Subject 2	RE	Art	Food	English	Computing
	Mon B	Tue B	Wed B	Thu B	Fri B
Core Activity	Sparx Maths XP	Reading	Sparx Maths XP	Reading	Sparx Maths XP
Subject 1	Geography	Sparx Maths Compulsory home learning	Science	Spanish	English
Subject 2	Music	History	Drama	DT	

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 8 Learning Cycle 1 Personal Learning Checklists

English

Key Ideas	S	O	R	T
What is the mystery genre?				
What are the important points in the plot of The Ruby in the Smoke?				
Who are the key characters in The Ruby in the Smoke and what are they like?				
Can I recall a range of structural methods used by Phillip Pullman?				
How do I use evidence to support my ideas about Pullman's characters?				
How does Victorian context influence Pullman's writing?				
How is Sally presented in the novel?				
How is Mrs Holland presented in the novel?				
What is a thesis introduction?				
How do I write a what, how, why paragraph?				
What is travel writing?				
Can I remember and use a range of sentence structures?				

Maths

Key Ideas	S	O	R	T
I can round numbers to the nearest whole number. ten, hundred, thousand, etc				
I can multiply with decimals				
I can add and subtract negative numbers				
I can estimate the solution to calculations				
I can multiply with large numbers				
I can multiply and divide with negative numbers				
I can write a number as a product of its prime factors, with/without calculator				
I can calculate the HCF and LCM of a pair of numbers				
I can find the area of rectangles, squares and parallelograms				
I can find the volume of a cube, cuboid of prism				
I can find the area and circumference of circles and partial circles				
I can identify the different parts of circles				

Maths

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 8 Learning Cycle 1 Personal Learning Checklists

Science

Key Ideas	S	O	R	T
I can identify organs in the respiratory system and describe their structure and function				
I can describe how the respiratory system is adapted for gas exchange				
I can recall word and symbol equations for aerobic and anaerobic respiration				
I can identify organs in the respiratory system and describe their structure and function				
I can explain how and why the respiratory systems respond to exercise				
I can describe the major bones and muscles in the skeletal and muscular system and describe how joints work				
I can identify what nutrients are needed for a healthy balanced diet				
I can describe how the digestive system is adapted for nutrient absorption				
I can explain the role of enzymes in digestion				

Science

Key Ideas	S	O	R	T
I can identify signs in a chemical and physical reaction.				
I can identify hazard symbols and state what the pH scale shows.				
I can describe a method for making a neutral solution from an acid and alkali				
I can use a word equation to show the reaction of an acid with a metal and an acid and metal carbonate				
I can identify what an exothermic and endothermic reaction is				
I can explain the factors that affect rates of reaction				
I can complete Boolean logic tables for AND and OR				

Year 8 Learning Cycle 1 Personal Learning Checklists

Geography

Key Ideas	S	O	R	T
Define key terms and give examples of case studies				
Describe the distribution of Cornwall's population				
Explain why Cornwall is experiencing a housing problem				
Describe the distribution of the world's population				
Explain how birth and death rates influence population growth and decline				
Explain the impacts of an ageing population in Japan				
Explain the impacts of a youthful population in Nigeria				
Explain the causes and effects of China's one child policy				
Explain the impacts of migration				

Geography

Key Ideas	S	O	R	T
Define key terms and give examples of case studies				
Explain the importance of the world's oceans				
Explain how warm and cold ocean currents distribute heat around the world				
Name all the world's oceans				
Explain the causes and effects of ocean plastic				
Explain how ocean gyres transport ocean plastic around the world				
Explain the impacts of ocean plastic pollution upon Henderson Island				
Explain the solutions to ocean plastic pollution				
Explain the impacts of marine pollution upon Kenya's coastline				

History

Key Ideas	S	O	R	T
I can outline the difference between a rural and urban society				
I can explain some of the changes that the Industrial Revolution caused in Britain				
I can outline why the conditions in Industrial Factories were so difficult for workers				
I can give an overview of the living conditions in Industrial Cities				
I can explain what is meant by the terms Nature, Origin and Purpose				
I can define the key terms Social, Economic and Political				
I can define the term "Transatlantic Slave Trade"				
I can explain the key term Abolition				

Year 8 Learning Cycle 1 Personal Learning Checklists

Spanish

Key Ideas	S	O	R	T
I understand the rules for correct Spanish pronunciation				
I know my non-negotiable past tense verbs				
I can express my opinion in Spanish				
I can confidently talk about my recent holidays				
I know how to form regular verbs in the preterite tense				
I know how to form regular verbs in the present tense				
I can name and describe different modes of transport				
I know how to make comparisons in Spanish				

Computing

Key Ideas	S	O	R	T
I know that the binary number system uses only two digits 1 and 0, like a switch (on and off)				
I know that the number system which uses ten digits (0-9) is called Decimal or Denary				
I know that binary is also called Base 2 because it only uses two digits and Denary is also called Base 10.				
I can explain how place value can be used to convert between Binary and Denary				
I know the units of measurements				
I can add 4-digit Binary numbers				
I can complete Boolean logic tables for AND and OR				

Computing

Key Ideas	S	O	R	T
I know how to run code using the Python IDLE				
I can write Python programs which use sequence				
I can describe what sequence means in Computing				
I can write Python programs which use selection				
I can describe what selection means in computing				
I can create flow diagrams of code using the correct symbols for input, output, process and selection				
I can use comments in my code to explain what is happening				
I know the definition of an algorithm, variable and the purpose of testing				

Year 8 Learning Cycle 1 Personal Learning Checklists

Art

Key Ideas	S	O	R	T
I can use tone, texture, line, shape, scale and composition in observational drawing				
I can explain the work of Halima Cassell and Peter Randall-Page and how they create and use texture				
I can explain how to develop my ideas into an abstract 3D form				
I have experimented with a range of materials				
I can refine my work through annotation				

DT

Key Ideas	S	O	R	T
I can use tools safely and with precision				
I can design a testing method to find how the position of the arm affects the distance travelled by the object				
I can obtain and display experimental data in an appropriate format				
I can ensure that I have mad a significant contribution within my team				
I can manage and respond appropriately to challenges presented by testing				

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				

Year 8 Learning Cycle 1 Personal Learning Checklists

RE

Key Ideas	S	O	R	T
I can define Islamophobia				
I can explain the negative impacts of Islamophobia				
I can give a brief outline of the 5 pillars of Islam				
I can define secular				
I can explain some of the challenges of being a religious teenager in a secular society				
I can define stereotype				
I explain some of the damage of stereotypes caused to individuals and groups				

Music

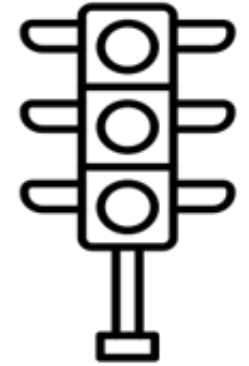| Key Ideas	S	O	R	T
I can play all four chords (C major, G major, A minor and F major) on the ukulele, keyboard or guitar				
I have made sure that I have learned the lyrics of at least three songs				
I understand what a chord is				
I know how to find notes on a keyboard/piano				
I am able to understand how to use roman numerals to identify chords				
I can read a chord diagram successfully				
I can perform in time and accurately as part of a larger group				

Drama

Key Ideas	S	O	R	T
I can think about characterisation and how to effectively represent my character				
I can used appropriate facial expressions, gestures, posture, proxemics and pace				
I can worked together as a group successfully where you all have an equal role				
I can perform with confidence and take the performance seriously				

Year 8 Learning Cycle 3 Personal Learning Checklists

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

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.

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

Year 8 Learning Cycle 1 English – The Ruby in the Smoke

1. Subject Vocabulary

1a = narrative A piece of writing that tells a story. Novels are the most common type of narrative writing.

1b = genre A type or category of writing (genre comes from the French word 'type') e.g. crime, fantasy.

1c = plot The name given to the main events in a play, novel or film.

1d = setting Where or when a story is set. It is usually introduced at the beginning of a story along with the characters.

1e = character A person, animal or being within a story. Writers use characters to perform the actions and speak, moving the plot along.

1f = minor character A character who doesn't appear as often as a main character but helps to move the plot along.

1g = context The circumstances surrounding writing, including important things in society and historical events.

1h = protagonist The main character in a novel, play or film.

1i = antagonist The principal opponent of the main character.

1j = gothic In literature, writing that creates mystery and fear; characters and settings that are crafted to unsettle the reader.

2. Subject Vocabulary: Structure

2a = structure The way a play, novel or poem is constructed and linked together.

2b = narrative hook A detail in a story that captures the attention of the reader and make them interested in finding out what will happen next.

2c = foreshadowing Details that act as hints or clues to the reader about what will happen later on in the text.

2d = beginning The way a text starts.
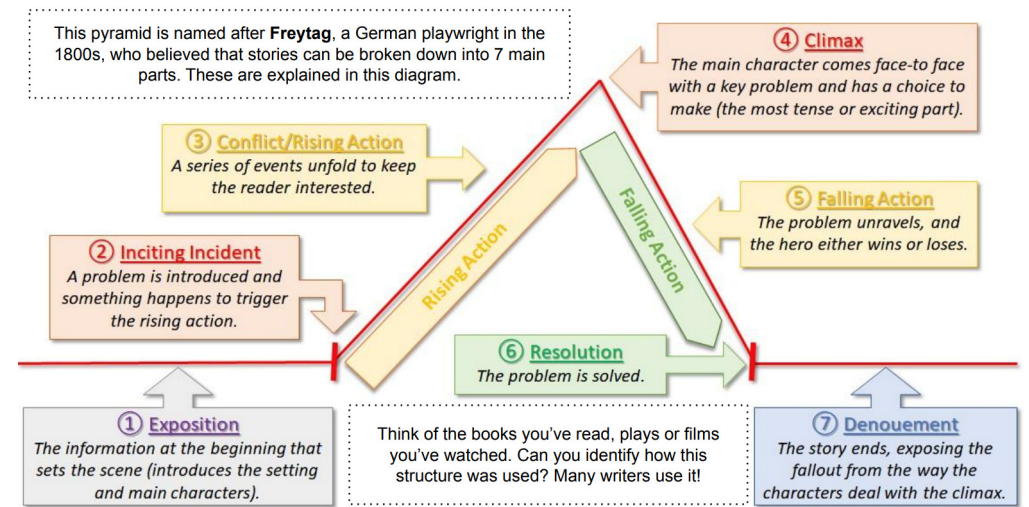
2e = zooming in Detailed description of something.

2f = zooming out Showing the reader the bigger picture.

2g = cliffhanger When a story or plotline ends suddenly or a large plot twist occurs and the reader is left uncertain.

2h = shift in focus When the plot or description moves from one things to another.

2i = resolution What happens at the end of a piece of writing.

3. Plot Structure: Freytag's Pyramid

This pyramid is named after **Freytag**, a German playwright in the 1800s, who believed that stories can be broken down into 7 main parts. These are explained in this diagram.

④ **Climax**
The main character comes face-to face with a key problem and has a choice to make (the most tense or exciting part).

③ **Conflict/Rising Action**
A series of events unfold to keep the reader interested.

⑤ **Falling Action**
The problem unravels, and the hero either wins or loses.

② **Inciting Incident**
A problem is introduced and something happens to trigger the rising action.

Rising Action

Falling Action

⑥ **Resolution**
The problem is solved.

① **Exposition**
The information at the beginning that sets the scene (introduces the setting and main characters).

Think of the books you've read, plays or films you've watched. Can you identify how this structure was used? Many writers use it!

⑦ **Denouement**
The story ends, exposing the fallout from the way the characters deal with the climax.

4. The Mystery Genre

4a = Genre Mystery is a genre of literature whose stories focus on a puzzling crime or situation that needs to be solved. Many mysteries revolve around an investigation into uncovering a culprit. There are always a set of suspects who come under suspicion before the crime is resolved at the end.

4b = History Mystery stories appeared in the 1800s. At this time, people began to crowd into cities and there was more crime. As the need for detectives emerged, the mystery genre emerged. Perhaps the most famous mystery writer is Arthur Conan Doyle. He created Sherlock Holmes in 1887.

4c = Plot The mystery story usually begins with a crime or murder. Readers then follow the detective's investigation. The author may hide clues and motives, revealing information as the story progresses. The protagonist will often be a detective who eventually solves the crime. Mystery novels always feature a villain who tries to cover up their crime.

5. Victorian Context

The Ruby in the Smoke is a neo-Victorian mystery detective novel, set in 1872.
In order to fully understand the plot, setting and characters, it is important to understand the following ideas relating to the Victorian context of the novel.

5a = Women in the Victorian era
Victorian Britain was a patriarchal society. Women were considered the 'property' of their fathers or their husbands. They could not vote. Their role was considered domestic and ornamental.

5b = Class System
There was a strict class system in place: upper class, middle class and working class. The working class were thought of as criminals, and many lived in slums. It was rare for the working class to receive help or sympathy. After the 1834 Amendments to the Poor Act the workhouse or prison were considered the correct treatment for poverty.

5c = Workhouses
If they could not work and earn enough for their own home, the poorest would live in bleak buildings, working long hours in exchange for food and shelter. Conditions were often very poor.

5d = The Police Force
A police force was introduced in Britain in 1829 by Sir Robert Peel. The first policemen were called 'Peelers' or 'Bobbies' after him.

5e = The Industrial Revolution 1760-1840
Britain moved from a mainly rural farming society to an industrialised, urban society. The way people in Britain lived was changed forever. Due to rapid population growth in towns and cities, the number of slums, amount of poverty and crime increased. In the novel, this is witnessed by Sally in London.

5f = The East India Trading Company
A company that bought and sold goods. In the 1800s, It had huge influence and power around the world - even having its own army in India twice the size of the British army - and is associated with a time of past glory when 'Britain Ruled the World'.

5g = Opium
A highly addictive drug. In order to trade with China, the Company traded opium grown in India. This had a terrible effect on Chinese society and led to several Opium Wars with China.

5h = Imperialism
The British exploited the addiction of millions of Chinese to opium in order to set up a trade deal with China. This is British Imperialism at its worst. The ruby itself could be said to be a symbol of British Imperialism

5h = The Indian Mutiny 1857-1858
A successful rebellion against the ruling East India Trading Company. The Company acted as the ruling power in India on behalf of the British Queen. It began with Sepoys who were in the Company army, then spread across the country. Both sides committed killings, with British women and children being murdered by rebelling Indians - but also whole villages of women and children being destroyed by British reprisals. It led to British Raj and India being governed by the British Government and not the Company. The Company ended in 1874.

6. Authorial Intent

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

6a = To intrigue...
readers using structural devices to reveal clues and build tension.

6b = To celebrate...
strong females who subvert the gender stereotypes of the Victorian era. This encourages readers of young adult literature to see females as strong leading protagonists - not just the submissive Princess waiting to be rescued by a male.

6c = To reveal...
the impact of the opium trade and the consequences of drug addiction. This trade was encouraged by the activities of the East Indian Trade Company.

6d = To expose...
the injustices of British Victorian society which affected the poor working class and women in particular.


7. Key Characters

7a - Sally Lockhart
Sally is not a typical Victorian girl: she has been brought up to be resourceful, independent and astute with figures. She has been trained in the use of guns by her father. She embodies the qualities of a hero, rather than conforming to Victorian stereotypes of the passive female. She finds it hard to show her feelings and is quite reserved.

7b – Frederic Frederick
is a bohemian photographer who is also very independent and free-spirited. He has a very likeable personality and people instinctively trust and warm to him.

7c – Mrs Holland
Mrs Holland is the main antagonist or villain of the novel, she was a beautiful woman in her younger years but is now a bitter and cruel criminal mastermind. She keeps Bedwell hooked on opium and treats Adelaide very cruelly; she also intends to kill Sally.
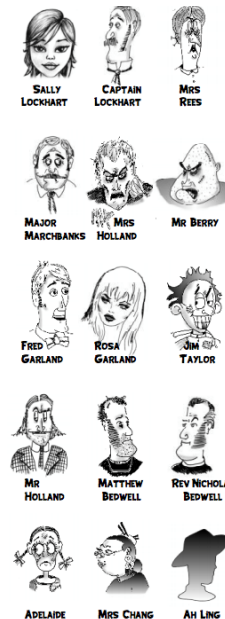
Year 8 Learning Cycle 1 English – The Ruby in the Smoke

8. Plot Summary

8a = Chapter 1: The Seven Blessings We meet Sally Lockhart. She visits her dead father's old offices and accidentally kills Mr Higgs. She meets Jim Taylor.

8b = Chapter 2: The Web Major Marchbanks reads about Sally in the newspaper. Mrs Holland discusses the ruby with her lawyer. Sailor Matthew Bedwell returns to London.

8c = Chapter 3: The Gentleman of Kent Sally goes to Kent to visit Major Marchbanks. Mrs Holland is also there—and Sally only escapes thanks to Fred Garland, a photographer.

8d = Chapter 4: The Mutiny On the train back to London, Sally reads through Major Marchbanks' diary. The diary is stolen from her by Mr Hopkins. Sally only has a few scraps of paper left.

8e = Chapter 5: The Ceremony of the Smoke Sailor Matthew Bedwell is in Mrs Holland's lodging house, looked after by little Adelaide. Opium is used to get to his secrets.

8f = Chapter 6: Messages Adelaide sees Jim for help. Sally and Jim realise that Mrs Holland wants the ruby— and needs the diary scraps as a clue. Mrs Holland forces Mr Hopkins to steal the scraps of paper and murdering Sally.

8g = Chapter 7: The Consequences of Finance Mr Hopkins cannot bring himself to murder Sally. Leaving the house, he is murdered by a mugger. Sally leaves Mrs Rees's house. She goes to her lawyer

8h = Chapter 8: The Passions of Art Desperate for somewhere to stay, Sally goes to Fred Garland. She meets Rosa and gets a job as their accountant. They decide that the scraps of paper are a treasure clue to the ruby.

8i = Chapter 9: A Journey to Oxford Fred and Sally go to Oxford to meet sailor Matthew Bedwell's brother, the Reverend Nicholas Bedwell. They decide to find some opium to help Nicholas.

8j = Chapter 10: Madam Chang Sally and Fred go to an Opium Den. Sally smells opium and has a 'nightmare' about murder, Major Marchbanks and her father. She realises it is a memory.

8k = Chapter 11: The Stereographic Repertory Company The Reverend Bedwell and Fred set off to rescue Nicholas. Mrs Holland gets hold of the scraps of paper and the clues to finding the ruby.

8l = Chapter 12: Substitution Fred and the Reverend Nicholas Bedwell rescue Matthew from Mrs Holland. Adelaide runs away to live with Fred, Rosa and Sally

8m = Chapter 13: Lights Below the Water Sally finds out that her father was murdered. She also learns about the deadly society of The Seven Blessings and its evil leaders, Ah Ling.

8n = Chapter 14: Arms and the Girl Sally practises firing her new gun.

8r = Chapter 18: London Bridge Sally takes the ruby to meet with Mrs Holland. She finds out the truth of her own identity then throws the ruby into the river. Mrs Holland kills herself by jumping in after it. Ah Ling turn up in a coach.

8s = Chapter 19: Ah Ling is a drug smuggler who betrayed and murdered Sally's father. He tries to blackmail Sally into joining him; she shoots him.

8t = Chapter 20: Ah Ling mysteriously disappears. Later, Sally finds a letter from Captain Lockhart and a large amount of money.

9. Vocabulary

9a = Nefarious (adjective) wicked, or criminal

9b = Deception (noun) the act of tricking, cheating or lying to someone

9c = Compulsion (noun) an irresistible urge to act or behave in a certain way

9d = Addiction (noun) a craving, habit or dependency on something

9e = Sleuth (noun) a person investigating something

9f = Retribution (noun) a punishment inflicted on someone as a penalty for a wrong act

9g = Intrepid (adjective) fearless or adventurous

9h = Mutiny (noun) an open rebellion against the authorities

9i = Justice (noun) the condition of being morally correct or fair

9j = Wily (adjective) clever or sharp-witted; skilled at gaining advantage.

9k = Patriarchy (noun) a system of society in which men hold the power and women are largely excluded from it.

9l = Subordinate (adjective) of less importance; weaker; inferior

9m = Duplicitous (adjective) to be deceitful and misleading; dishonest or two-faced

9n = Malevolent (adjective) wanting to cause harm or commit evil

Year 8 Learning Cycle 1 English - Travel Writing

1. Travel Writing

Travel writing is non-fiction (real life) writing that describes travelling and visiting different parts of the world. Travel writing can take the form of newspaper and magazine articles, memoirs, blogs, journals, tourist guides or even whole books.

Travel writing should be engaging and should paint a vivid picture for the readers, so descriptive adjectives and sensory language is vital for creating a rich and immersive text. Additionally, using details about local culture, cuisine, and landmarks is important.

2. Vocabulary for Travel Writing

☺

Enchanting
Eclectic
Breathtaking
Fascinating
Idyllic
Thrilling
Picturesque
Majestic
Vibrant

☹

Dilapidated
Overcrowded
Chaotic
Unsettling
Unsafe
Uninviting
Disappointing
Mediocre
Unappealing

3. Sentence Structures

3a = Simple sentence A sentence made up of one independent clause.

The air was choked with smog.

3b = Compound sentence A sentence connecting up of two independent clauses, with a coordinating conjunction.

The noise from the omnibuses was deafening and the shouts of the street-sellers added to the din.

3c = Complex sentence A sentence that contains an independent clause with one or more subordinate clauses.

When we turned into Portman Square, I was taken aback by the majestic buildings lining the street.

3d = Independent clause A series of words that can stand alone as a sentence and expresses a complete thought.

The air was choked with smog.

3e = Subordinate clause A series of words that cannot stand alone as a complete sentence; it supports a sentence's independent clause.

After nightfall,   Despite the chaos on the roads,

3f = Coordinating conjunction Words that link parts of a sentence of equal importance together.

And, but, or.

3g = Subordinating conjunction Words and phrases that connect dependent clauses to independent clauses.

If, despite, as, when, although, while, after, before, until, because.
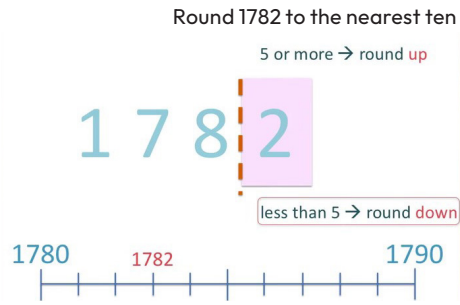
Year 8 Learning Cycle 1 Maths

Key Terms	Description
Integer	Whole number
Estimate	Finding a rough answer to a calculation by rounding each value to 1sf
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
Solve	Solving an equation means finding the value of the unknown variable
Area	The amount of 2d space which a shape takes up
Volume	The amount of 3d space which a shape takes up
Tangent	A straight line which touches the circumference of a circle at a single point
Circumference	The distance around the outside of a circle
Arc	A portion of the circumference of a circle
Chord	A straight line with connects one part of a circumference to another, without passing through the center
Diameter	A straight line with connects one part of a circumference to another, passing through the center
Radius	A straight line which goes from the center of a circle to the circumference

Year 8 Learning Cycle 1 Maths - Calculations and number

1. Rounding

Identify the digit in the column given.

Go to the next digit decide whether to round up

Round 1782 to the nearest ten

5 or more → round up

$$1\ 7\ 8\ |\ 2$$

less than 5 → round down

1780   1782   1790

2. Estimating

Round all numbers to 1sf

Complete calculation with rounded numbers

$307 + 991 \approx 1300$

$300 + 1000$

1300

3. Multiplication

Multiply each digit, starting with the ones.

If the result is greater than 10- carry the 10s to the next column.

175 x 5

$$
\begin{array}{ccc}
1 & 7 & 2 \\
 & & 5 \\
\end{array}
$$

$\times$

$$
\begin{array}{ccc}
 & 6 & 0 \\
\hline
3 & 1 & \\
\end{array}
$$

4. Multiplying Decimals

Multiply as if no decimal point

Answer has as many decimal places as in the question

3.4 x 2.86
x10   x100

$$
\begin{array}{r}
2\ 8\ 6 \\
\times\quad 3\ 4 \\
\hline
1\ 1\ 4\ 4 \\
8\ 5\ 8\ 0 \\
\hline
9\ 7\ 2\ 4 \\
\end{array}
$$

9724 ÷ 10 ÷ 100
= 9.724

5. Adding & Subtracting negative numbers

Subtracting ←   → Adding

-5 -4 -3 -2 -1 0 1 2 3 4 5
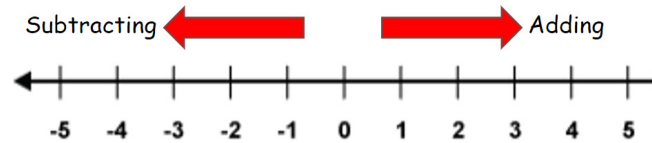
-1 + -3 = -1 - 3 = **-4**

Mixed means minus

-3 - -6 = -3 + 6 = **3**

It's not mixed, so it's not minus

6. Multiplying & Dividing negative numbers

Comeplete the multiplication ignoring the signs

Decide on the sign- Mixed Means Minus

Calculate (-3) × (-2)

+ × + } +
− × −

▶ (-3) × (-2) = +6

+ × − } −
− × +

7. Prime Factor Decomposition

Break number down into factor pairs

Circle prime numbers

30       $30 = 2 \times 3 \times 5$

5   6

2   3
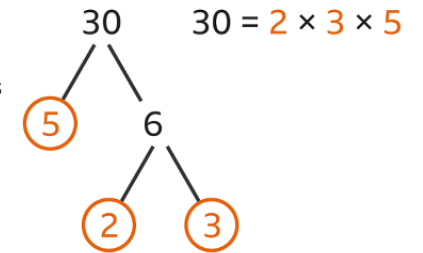
8. HCF & LCM

HCF– The numbers which appear in both lists

$12 = 2 \times 2 \times 3$

$18 = 2 \times 3 \times 3$

Common factors

$HCF = 2 \times 3 = 6$

LCM– HCF x the numbers leftover in both lists
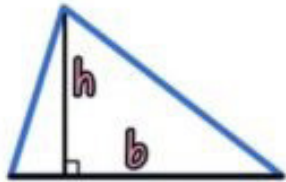
LCM= 6 x 2 x 3

LCM = 36

21

Year 8 Learning Cycle 1 Maths - Area and Volume

1. Area of sqares and rectangles
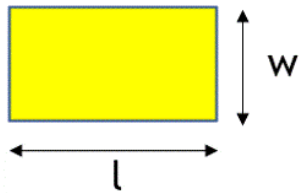
Units will be squared

e.g. cm^2

Area = $l \times w$

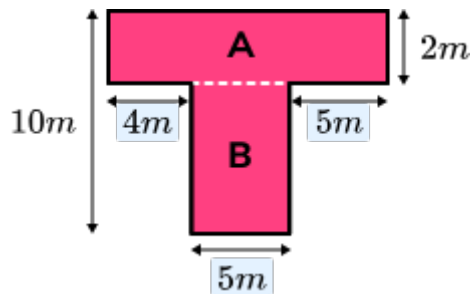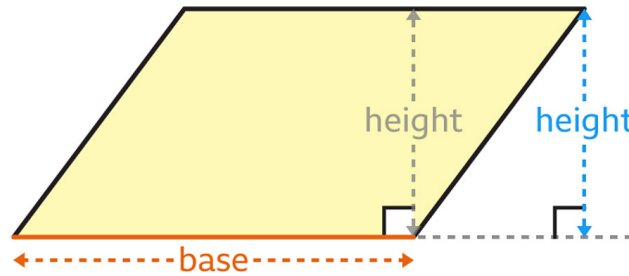## 2. Area of triangles

$$Area = \frac{1}{2} \times b \times h = \frac{bh}{2}$$

3. Compound shapes

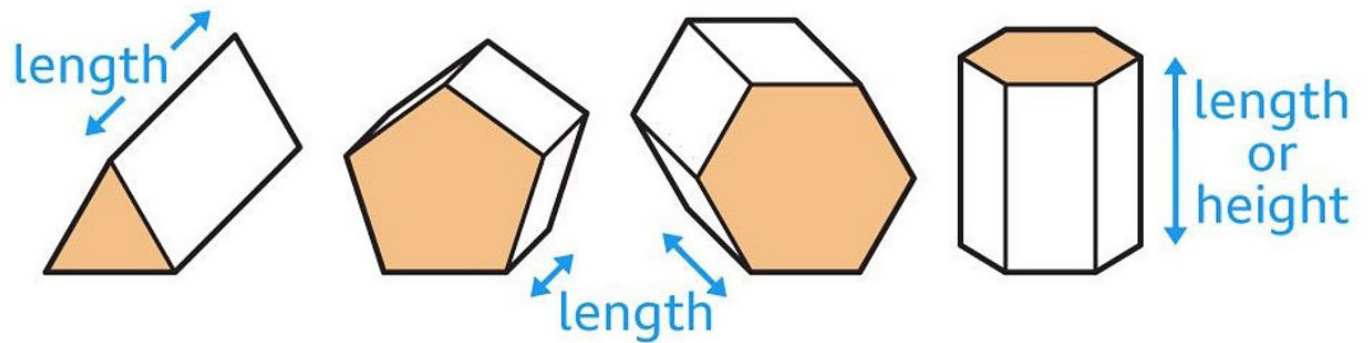Split into regular shapes.
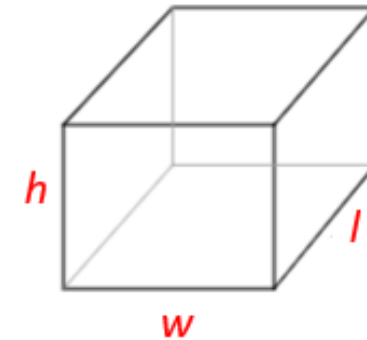
Find the areas of each.

Add together.

A 2m

10m 4m 5m

B

5m

4. Area of parallelograms

height   height

base

Area of parallelogram

base × perpendicular height

5. Volumes of cuboids

Units will be cubed

e.g. cm^3

Volume = $l \times w \times h$

h   l   w

6. Volume of prisms

Volume = Area of cross-section × length

length

length

length
or
height

Year 8 Learning Cycle 1 Maths - Circles

1. Circle Vocabulary

circumference, diameter, arc, sector, central vertex, radius, chord, segment

2. Area of a circle

$$A = \pi r^2$$
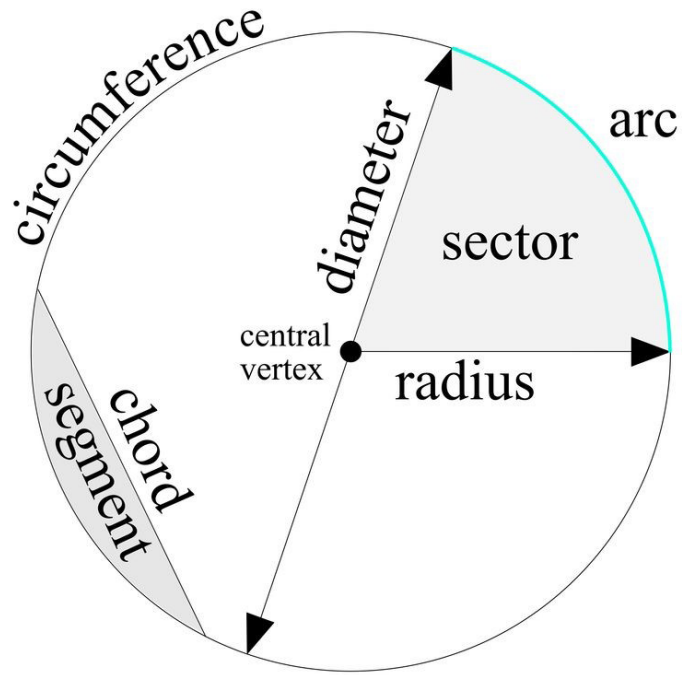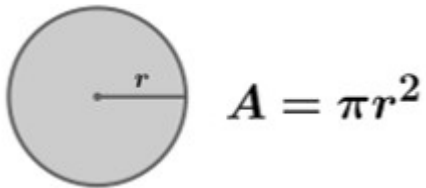
If the question asks you to round, type the answer into your calculator

$A = \pi \times (3)^2$

$A = 9\pi \ m^2$

$A = 28.3 \ m^2$

3. Circumference

$C = \pi d$ $\qquad$ $C = 2\pi r$

$r = 3m$

$d = 6m$

$A = \pi \times 6$

$A = 6\pi \ m$

$A = 18.8 \ m$
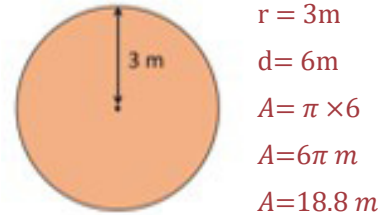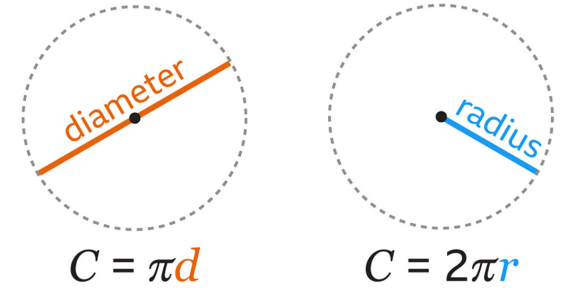
5. Parts of a circle-area

Area of a circle	Area of a ¼ Circle
Area = πr²	Area = ¼ πr²

6. Parts of a circle- perimeter
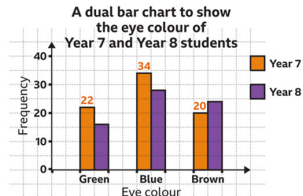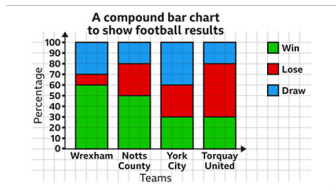
Find the circumference of the whole circle and half it. This is the arc length.

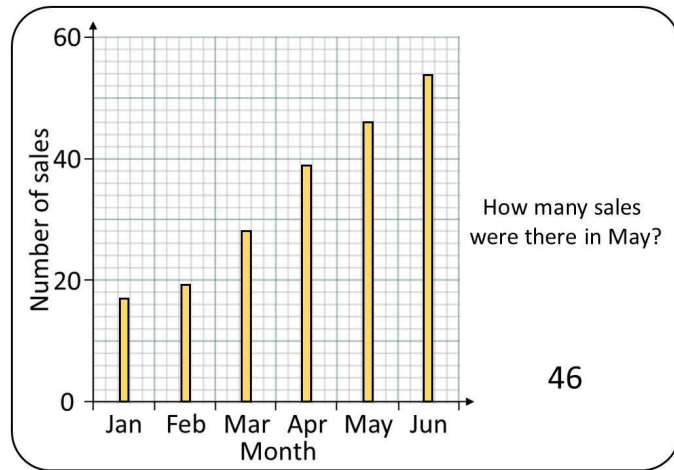Add the diameter- this is the straight edge.

half the circumference

diameter
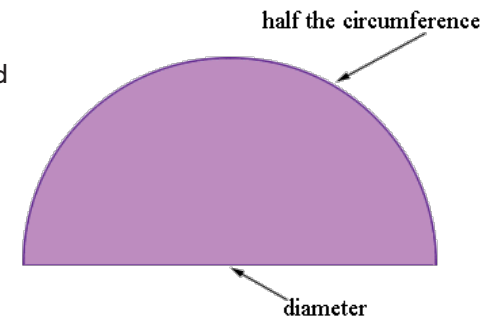
Year 8 Learning Cycle 1 Maths - Statistics, Graphs and Charts

1. Bar Charts

A compound bar chart to show football results

A dual bar chart to show the eye colour of Year 7 and Year 8 students

2. Vertical line graphs

How many sales were there in May?
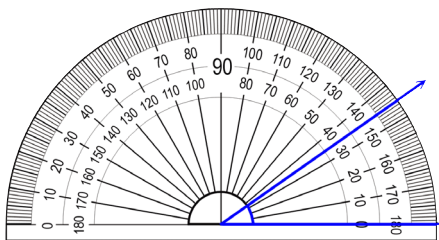
46

3. Using a protractor

Base line goes on one of the straight lines.

Centre point on the vertex.

Follow the numbers around from zero, following the arc.

4. Pie Charts

The size of the slice represents the proportion of the data being represented.

5. Bivariate data

Represents two pieces of information about one thing

A scatter graph showing the height and weight of ten students
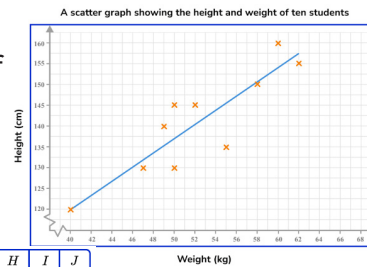
Student	A	B	C	D	E	F	G	H	I	J
Height (cm)	120	145	130	155	160	135	150	145	130	140
Weight (kg)	40	50	47	62	60	55	58	52	50	49

6. Scatter Graphs

Positive correlation
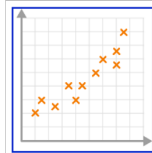
Negative correlation
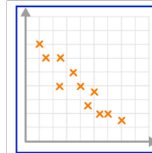
No correlation

7. Scatter Graphs

Interpolation
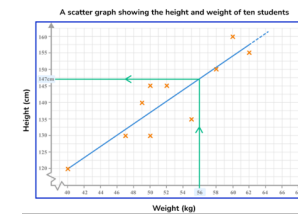
Extrapolation

8. Frequency Polygon

Sandwich Sales: Thursday

24
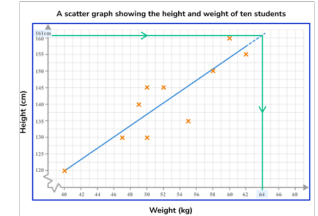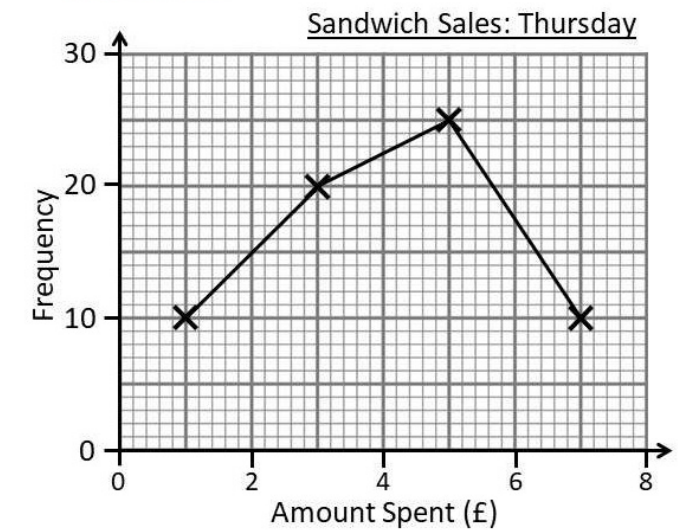
Year 8 Learning Cycle 1 Maths - Expressions and equations

1. Expanding, Factorising, substituting

Factorising

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

Expanding brackets

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

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

$= 30 \quad - \quad 8$

$= \quad 22$ ✓

2. Function machines

input —— ×3 —— output
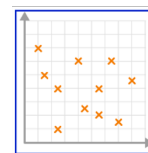
input —— ÷3 —— output

3. 1-step & 2-step equations

$$10x - 24 = 82$$
$+24$ $\qquad$ $+24$
$$10x = 106$$
$÷10$ $\qquad$ $÷10$
$$x = 10.6$$

4. Equations with variable on denominator

$$\frac{108}{y} - 2 = 7$$
$+2$ $\qquad$ $+2$
$$\frac{108}{y} = 9$$
$\times y$ $\qquad$ $\times y$
$$108 = 9y$$
$÷9$ $\qquad$ $÷9$
$$12 = y$$

5. Equations with brackets

1. Expand the brackets
2. Solve as normal

6. Equations with variable on both sides

$$2y + 9 = 8y - 21$$
$-2y$ $\qquad$ $-2y$
$$2y + 9 - 2y = 8y - 21 - 2y$$
$$9 = 6y - 21$$
$+21$ $\qquad$ $+21$
$$30 = 6y$$
$÷6$ $\qquad$ $÷6$
$$5 = y$$

7. Forming equations with shape

Perimeter = 56cm

x + 12

$x + x + 12 + x + x + 12 = 56$

$44x + 24 = 56$

8. Forming equations with words

I think of a number.

I multiply the number by 3 and then add 5.

The answer is 29

$$3x + 5 = 29$$

Year 8 Learning Cycle 1 Maths - Calculator Features

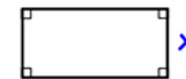| ×	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30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

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**.

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

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

relative atomic mass
atomic symbol
name
atomic (proton) number

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

Neutrons = Mass number – Atomic number

Non-Metals

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

Transition Metals

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.

| Group: | 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

1 H hydrogen 1

Mg

Ne

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

Nucleus: Protons and Neutrons

Shells: Electrons
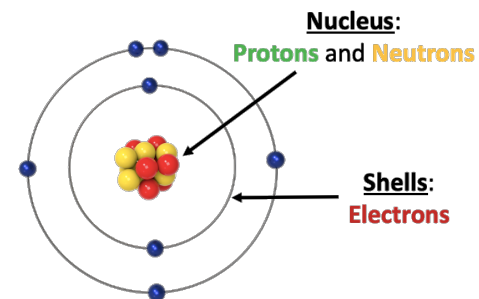
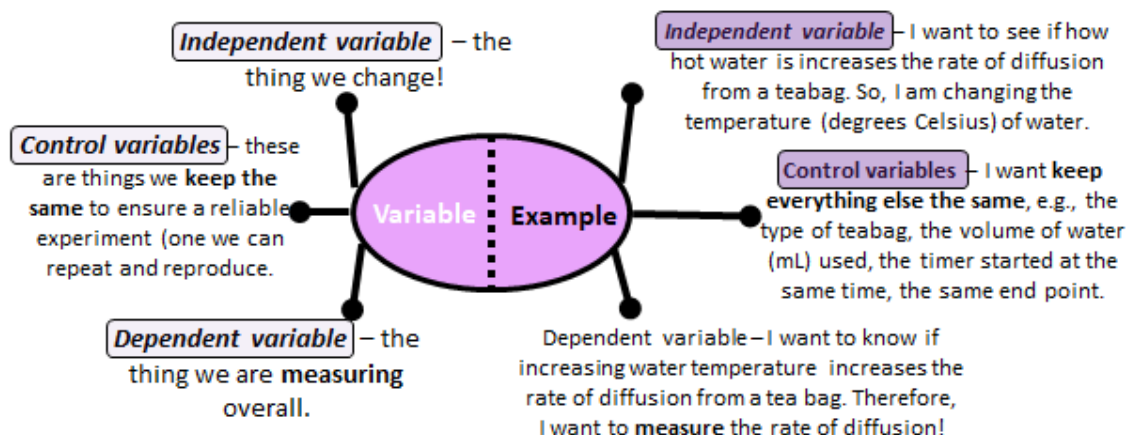# Year 8 Learning Cycle 1 Science - Experiments

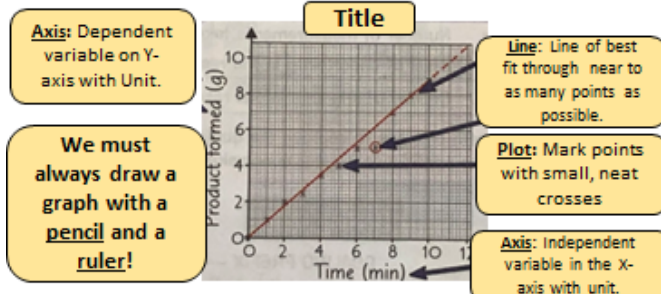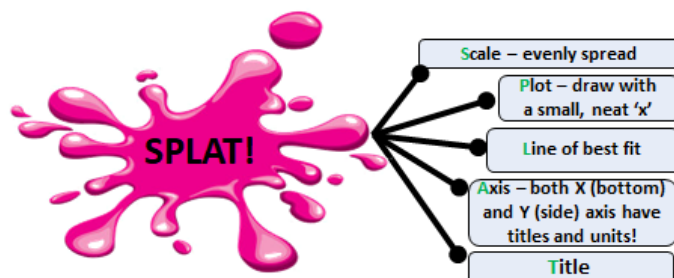| Key Terms	Description
Independent variable	The variable you change in an investigation
Dependent variable	The variable you measure in an investigation
Control variable	The variable you keep the same in an investigation
Hypothesis	A prediction of what will happen in an investigation
Reliability	We use 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

SPLAT!

- Scale – evenly spread
- Plot – draw with a small, neat 'x'
- Line of best fit
- Axis – both X (bottom) and Y (side) axis have titles and units!
- Title

Axis: Dependent variable on Y-axis with Unit.

We must always draw a graph with a pencil and a ruler!

Title

Line: Line of best fit through near to as many points as possible.

Plot: Mark points with small, neat crosses

Axis: Independent variable in the X-axis with unit.

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 8 Learning Cycle 1 Science - Key terms
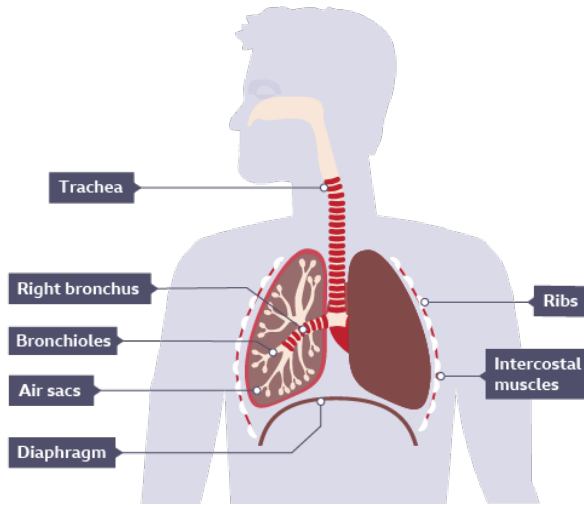
1. Sports science

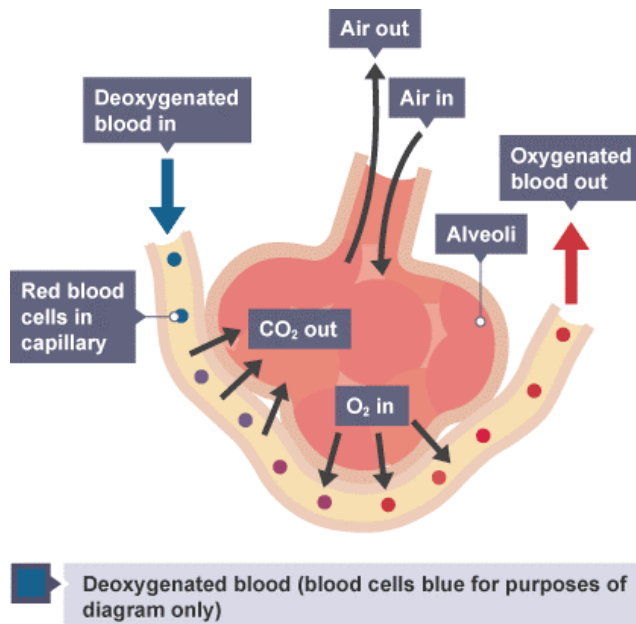| Key Terms	Description
Trachea	Also known as the windpipe – it is the tube that connects the mouth and nose to the bronchus. Rings of cartilage keep the trachea open
Bronchus	Where the trachea branches (splits) into the left and right lungs
Bronchiole	Each bronchus branches again to form many more passageways for air into and out of each lungs
Alveoli	The tiny air sacs at the end of each bronchiole where gases are exchanged into and out of the blood
Diaphragm	A sheet of muscle that contracts (tightens) and relaxes (loosens) to allow air to be breathed in and out
Diffusion	The movement of particles from an area of high concentration to an area of low concentration
Aerobic respiration	A chemical reaction inside cells that releases energy from glucose by reacting it in the presence of oxygen
Anaerobic respiration	A chemical reaction inside cells that releases energy from glucose WITHOUT oxygen
Artery	A blood vessel that carries blood away from the heart
Vein	A blood vessel that carries blood back to the heart
Capillary	A tiny blood vessel that is only one cell thick so that substances can be easily exchanged across it
Oesophagus	Also known as the gullet – It is a tube that connects the mouth to the stomach
Intestine	The part of your digestive system where most substances are absorbed – there is a small and large intestine
Lipids	The scientific name for fats and oils
Enzyme	Chemicals secreted (released) by glandular tissue that help to digest (break down) nutrients (long-chain substances) in the foods we eat

2. Chemical reactions

Key Terms	Description
Chemical reaction	When chemical bonds are broken and made between atoms, so that new substances (compounds or elements) are made
Reactant	The chemical present at the start of the reaction
Product	The chemical which is made in a chemical reaction
Catalyst	A substance that speeds up a chemical reaction
Exothermic	When energy is transferred to the surroundings and usually feels hot
Endothermic	When energy is taken in from the surroundings and usually feel cold
Combustion	A chemical reaction where fuel is burned and reacts with oxygen to release energy
Thermal decomposition	A chemical reaction that happens when a compound breaks down when heated

Year 8 Learning Cycle 1 Science - Sports Science

1. The Respiratory System

Labels: Trachea, Right bronchus, Bronchioles, Air sacs, Diaphragm, Ribs, Intercostal muscles

2. Gas Exchange

Labels: Air out, Air in, Deoxygenated blood in, Oxygenated blood out, Alveoli, Red blood cells in capillary, CO_2 out, O_2 in

Deoxygenated blood (blood cells blue for purposes of diagram only)

3. Aerobic and Anaerobic Respiration

Aerobic Respiration:

glucose + oxygen → carbon dioxide + water

Anaerobic Respiration:

glucose → lactic acid

	Reactants	Products	Rate of Reaction	Energy Released
Aerobic Respiration	Glucose, oxygen	Carbon dioxide, water	Slow	More
Anaerobic Respiration	Glucose	Lactic acid	Fast	Less

4. Blood vessels

Labels: Wall is one cell thick, Lumen, Capillary

Labels: Connective tissue, Muscle and elastic fibres, Inner lining – Endothelium, Lumen, Artery, Vein

5. The Circulatory System

Labels: Pulmonary arteries, Right lung, Pulmonary veins, Left lung

6. The Skeletal System

Labels: Skull, Clavicle (Collarbone), Sternum (Breastbone), Spine, Femur, Tibia, Humerus, Ribcage, Radius, Ulna, Patella (Kneecap), Fibula
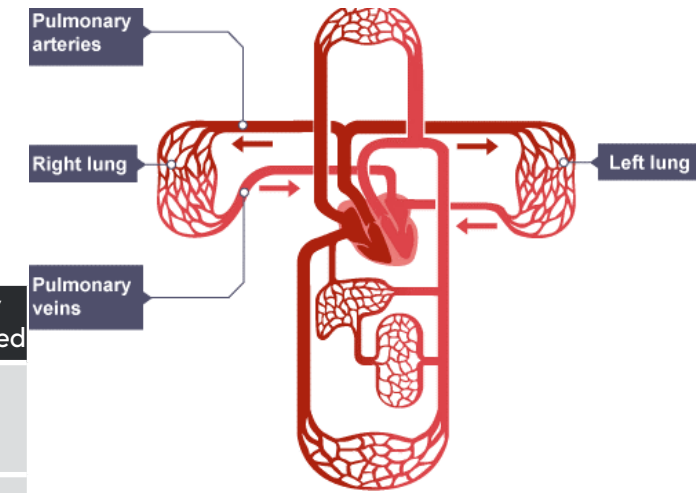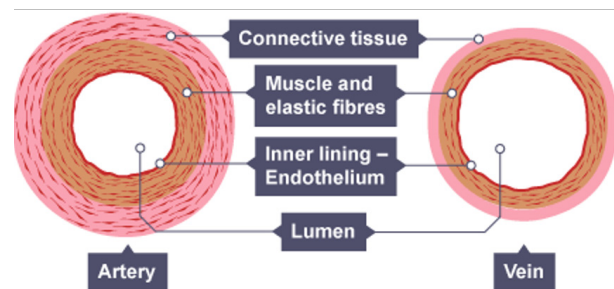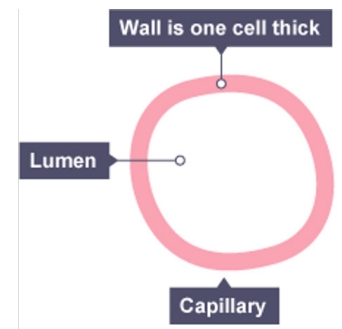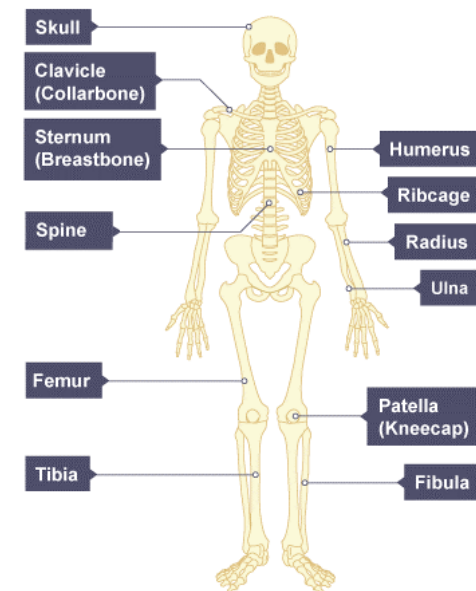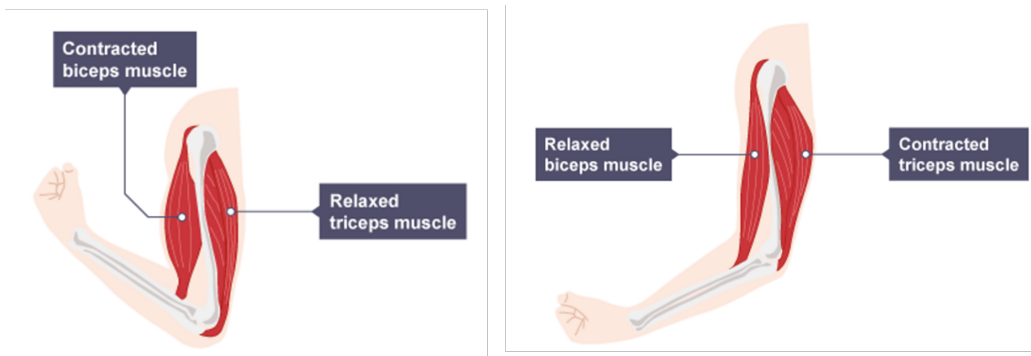
Year 8 Learning Cycle 1 Science - Sports Science
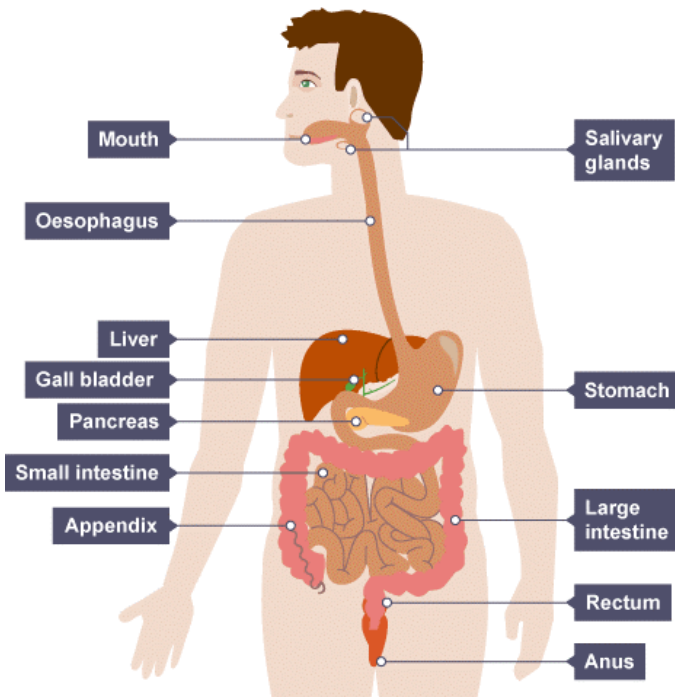
7. How Muscles work

8. Healthy Diet

To keep healthy, it is vital to eat a balanced diet. This means eating the right amount from different food groups. Too much may cause obesity and too little may cause malnutrition.

There are seven major nutrients to include in a healthy diet: Carbohydrates, Proteins, Fats, Vitamins, Minerals, Water and Fibre

9. The Digestive System

10. Enzymes and Digestion

Enzymes are chemicals made from proteins that help to break down our foods into smaller molecules so that they can be absorbed into our bloodstream

Name of enzyme	Where it is produced	Nutrient that it helps to digest
Carbohydrase	Mouth, pancreas and small intestine	Carbohydrates
Protease	Stomach, pancreas and small intestine	Proteins
Lipase	Pancreas and small intestine	Lipids (Fats)

11. Further reading, websites

Respiration and Gas Exchange

https://www.bbc.co.uk/bitesize/topics/zvrrd2p

SCAN ME

The Skeletal System

https://www.bbc.co.uk/bitesize/topics/znyycdm/articles/zgbddp3

SCAN ME

Digestion

https://www.bbc.co.uk/bitesize/topics/zf339j6

SCAN ME

Year 8 Learning Cycle 1 Science - Chemical Reactions

## 1. Physical and chemical changes

PHYSICAL CHANGES
In a physical change, matter changes form but not chemical identity.

MELTING ICE
SHREDDING PAPER
CHOPPING WOOD
MIXING GRAY AND GREEN MARBLES
ThoughtCo

CHEMICAL CHANGES
In a chemical change, a chemical reaction occurs and new products are formed.

BURNING WOOD
ROTTING BANANA
MIXING VINEGAR AND BAKING SODA
FIREWORKS

2. pH
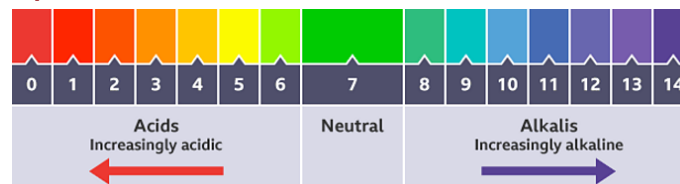
Neutral solutions are exactly pH 7.

Acidic solutions have pH values less than 7. The closer to pH 0, the more acidic a solution is.

Alkaline solutions have pH values more than 7. The closer to pH 14, the more alkaline a solution is.

3. Acid Reactions

Acids react with some metals to produce a salt and hydrogen gas.

Metal + acid → salt + hydrogen (M.A.S.H)

Naming the salt from the reaction of a metal and an acid

1. The first word is the name of the metal For example, a salt made when magnesium is added to an acid would have magnesium as its first word.

2. The second word of the name is taken from the name of the acid

Hydrochloric acid → chloride
Nitric acid → nitrate
Sulfuric acid → sulfate

Most reactive
Potassium
Sodium
Calcium
Magnesium
Aluminium
Zinc
Iron
Tin
Lead
Copper
Silver
Gold
Platinum
Least reactive

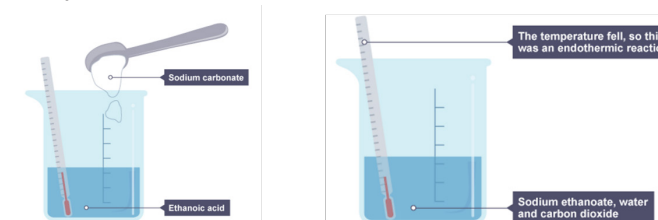| Metal	Acid	Salt name
Magnesium	Nitric acid	Magnesium nitrate
Calcium	Hydrochloric acid	Calcium chloride
Zinc	Sulfuric acid	Zinc sulf

4. Exothermic and endothermic
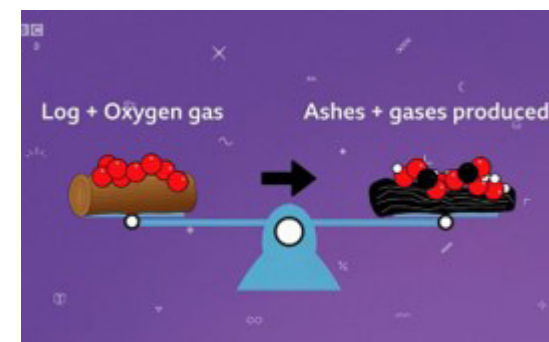
Example of an exothermic reaction
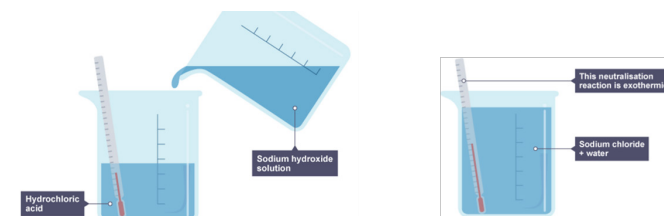
The temperature on the thermometer has risen, meaning it is an exothermic reaction.

Example of an endothermic reaction

The temperature on the thermometer has fallen, meaning it is an endothermic reaction.

5. Conservation of mass

Log + Oxygen gas   Ashes + gases produced

Whenever a physical or a chemical change happens, the mass of the chemicals before is the same as the mass of the chemicals after. This is called the Law of Conservation of Mass.

Year 8 Learning Cycle 1 Science – How to Approach 6 Mark Questions

1. How to approach 6 mark questions in Science – Sports Science

Question	Explain how the change in _____ during excercise halps an athlete
Info	You could be asked to explain why the following changes happen during exercise: • Increased stroke volume • Increased heart rate • Increased breathing rate • Increased breathing depth To answer this question you will need to do the following: 1. Identify the change that has happened 2. Describe what this change involves 3. Explain how this change benefits the athlete
Top tip	If you are explaining why a change happens during exercise use the following phrase: **"This change increases the supply of oxygen, which means that there is more available for aerobic respiration so there is more energy released."**
Model answer	**Explain how the change in stroke volume during exercise helps an athlete.** An increase in stroke volume means that with each heart beat the heart pumps more blood around the body. This means that there is increased supply of oxygen to the muscle cells and so there is more energy available for muscle cells.
Practice	1. Learn and practice the model answer above. 2. Prepare and learn model answers to explain how increased heart rate, increased breathing rate and increased breathing depth benefit an athlete.

2. How to approach 6 mark questions in Science – Chemical reactions

Question	Explain what you would observe when a metal is added to an acid. Explain what happens when any acid reacts with an akali. Describe how you could deteremine the pH of a substance.
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 what you would observe when a metal is added to an acid.** When a metal is added to an acid, I would observe **bubbles.** This is because when a metal is added to an acid **hydrogen** is produced. I would also expect the container to **feel warm** this is because a metal reacting with an acid is an **exothermic reaction**. Finally, I would expect the metal to disappear over time. This is because it is reacting and making the salt which would disolve.
Model answer	**Explain what happens when any acid reacts with any akali.** When and acid and alkali react the **H⁺ ions** from the acid react with the akalis **OH⁻ ions** to make water.
Model answer	**Describe how you could determine the pH of a solution.** To determine the pH of a solution you could add universal indicator. You would observe the colour that the indicator turned and use the chart to identify the pH. You could alternatively use a pH probe by dipping this into the solution and recording the value on the digital display.
Practice	1. Learn and practice the model answers above.

Year 8 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...

The Usborne Illustrated Dictionary of SCIENCE — A complete reference guide to physics, chemistry and biology with recommended websites

THE SCIENCE BOOK — BIG IDEAS SIMPLY EXPLAINED

Why is SNOT green? and other extremely important questions (and answers) from the Science Museum — Glenn Murphy

HORRIBLE SCIENCE — THE HORRIBLE SCIENCE OF EVERYTHING — NICK ARNOLD and TONY DE SAULLES

WORLD OF SCIENCE — Human Body Inventions Space Planet Earth Animals

READ TO SUCCEED

2. Young scientists club

Science or magic?

A+ = √Science ∨ MAGIC!

Miss Freestone and Miss Millward
S6
Wednesdays 3.15pm

YOUNG SCIENTIST'S CLUB

3. STEM club

Could you survive a Zombie Apocalypse?
Tuesday 3.15pm in S3 with Mr Stone

ZOMBIE OUTBREAK

POLTAIR 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
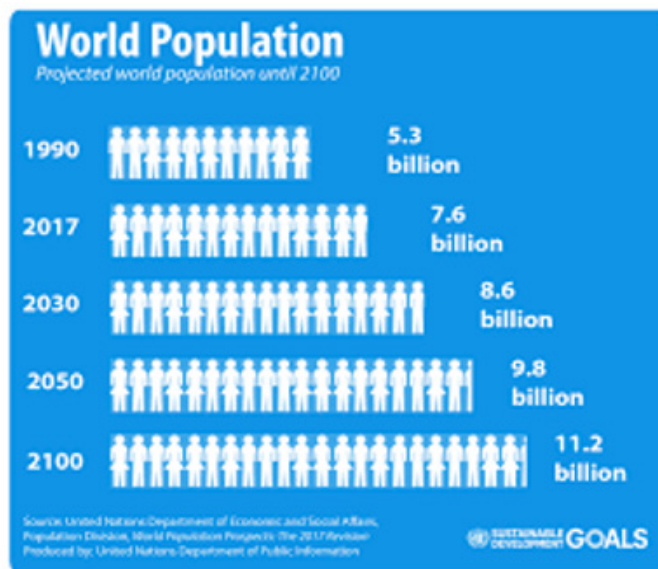
NASA

https://www.nasa.gov/

Year 8 Learning Cycle 1 Geography - Is population growth sustainable?

Key Terms	Description
Ageing population	Low birth rate and death rates, resulting in a larger proportion of elderly people
Birth rate	The number of live births per thousand of population per year
Death rate	The number of deaths per thousand of population per year
Demographic	The structure of a population
Immigration	The action of coming to live permanently in another country
Migration	The movement of people from one location to another
Natural Increase	How the population has changed due to birth and death rates. Calculated by the number of people born – the number of people who have died
Population	The number of people living within an area
Pull factor	A factor bringing someone into a location e.g. good healthcare
Push factor	A factor pushing someone away from a location e.g. conflict

World Population
Projected world population until 2100

Year	Population
1990	5.3 billion
2017	7.6 billion
2030	8.6 billion
2050	9.8 billion
2100	11.2 billion

Source: United Nations Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2017 Revision

Produced by: United Nations Department of Public Information

SUSTAINABLE DEVELOPMENT GOALS

Push Factors
- few services
- lack of job opportunities
- unhappy life
- poor transport links
- natural disasters
- wars
- shortage of food

Pull Factors
- access to services
- better job opportunities
- more entertainment facilities
- better transport links
- improved living conditions
- hope for a better way of life
- family links

Ageing (or greying) – a high proportion of people aged over 65. the UK has an ageing population

Youthful – a high proportion of people aged under 16 – Uganda is an example

Impacts:
- Not enough working population to look after older people in care homes
- More money needed to pay out state pensions from taxes
- more research into older person diseases such as dementia needed

Impacts:
- Population grows meaning a need for more resources such as food or housing
- More money needed for / jobs required in nurseries or schools or child care
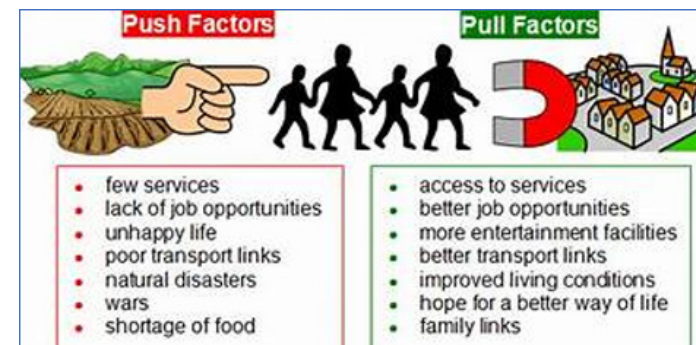
Factors impacting on birth rate
- Access to contraception and family planning.
- Reliance on large families in LICs to assist with work.
- Government policies
- Cost of living and raising a child.
- Women working and having children later.

Factors impacting on death rate
- Access to medication and high quality health care.
- Access to vaccinations.
- Access to clean water and nutritious food.
- War and conflict.
- Lower infant mortality rates

Reading
BBC Bitesize – Population – KS3 Geography

https://www.bbc.co.uk/bitesize/topics/zg7nvcw/articles/zxv4cmn

SCAN ME

1. Key Terms

1. Key Terms	Description
Gyre	A gyre is a large system of rotating ocean currents
Thermohaline circulation	Thermohaline circulation transports and mixes the water of the oceans. In the process it transports heat, which influences regional climate patterns
Global Conveyer Belty	A system of ocean currents that transport water around the world
Biodiversity	All the variety of life that can be found on Earth (plants, animals, fungi and micro-organisms) as well as to the communities that they form and the habitats in which they live
Microplastics	Small plastic pieces less than five millimetres long which can be harmful to our ocean and aquatic life
Coriolis effect	The apparent acceleration of a moving body on or near the Earth as a result of the Earth's rotation
Midnight zone	A layer of the ocean which starts at around 3,300 feet deep and goes to the bottom of the ocean floor. In this zone, there is total darkness and the temperatures here are close to freezing

2. The world's oceans and currents

Warm current   Cold current   Neutral current
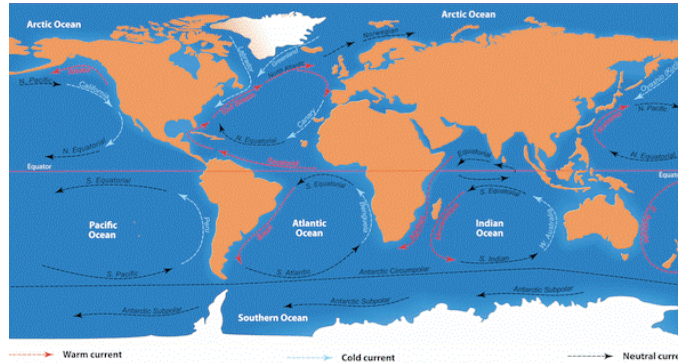
Ocean gyres circulate large areas of ocean. There are five major gyres which are driven by the Coriolis effect and surface winds. In the northern hemisphere gyres flow clockwise, whereas in the southern hemisphere gyres flow anti-clockwise.

3. The importance of our oceans

The ocean covers about 70% of our planet and does several important things for us that are vital to life on Earth. Oceans also regulate the atmosphere of Earth as it acts as a global climate system. Microscopic plants called phytoplankton grow near the ocean surface and absorb CO2 just like trees. Other sea creatures, such as snails, also absorb CO2 through the creation of their shells. When they die, their shells sink to the deep ocean where they become sediment, or they dissolve in areas of very deep ocean. Also, as surface waters cool and sink far from the equator, they absorb CO2 from the atmosphere and transfer it to the deep ocean where it may take centuries to millennia to return to the surface.

The ocean does an excellent job of absorbing excess heat from the atmosphere. The top few meters of the ocean stores as much heat as Earth's entire atmosphere. So, as the planet warms, it's the ocean that gets most of the extra energy.

4. Henderson Island

Henderson Island is a tiny, uninhabited island in the middle of the Pacific Ocean, 3000 miles from major population centers. Though it is half the size of Manhattan, more than 19 tonnes of litter pollute its white, sandy beaches.

Researchers estimate that it has the highest concentration of debris of any place in the world, for a total of 37 million pieces on the entirety of the small island. For every square metre you walk, you'll find approximately 627 pieces of rubbish.

5. What is the plastic problem?

Plastic is a material consistent of a wide range of synthetic polymers that are malleable and so can be moulded into solid objects. Plastic was widely used in manufacturing as it is cheap, lightweight and extremely hard wearing. However, because plastic is so hard wearing, we are now aware of the environmental impact that plastic has. In the ocean, plastic debris injures and kills fish, seabirds and marine mammals including whales.

6. We can solve our oceans if we:

- Reduce – use less single use plastic. 90% of the plastic items in our daily lives are used once and then thrown away. The UK government has since banned plastic straws and free carrier bags in shops to reduce the amount of single use plastics.

- Reuse – Find other uses for plastic materials that have already been used e.g. reuse plastic bags for future shops / create containers out of plastic pots etc.

- Recycle – dispose of plastic waste appropriately by recycling instead of throwing away in the bin.

- Rethink – educate people further about the issues of plastic waste and how we can solve the plastic problem.

- Clean up! – take part in local beach clean operations. Look out for organisations such as the 2-minute foundation and get involved where you can!

#2 MINUTE
BEACH CLEAN
STREET CLEAN
LITTER PICK
WWW.2MINUTE.ORG

WHAT IS CORAL BLEACHING?

Coral reefs are highly vulnerable to a changing climate. Warmer ocean temperatures and other stressors cause coral bleaching events which can damage and destroy coral reefs and the ecosystems they support.

1 HEALTHY CORAL

Coral and algae depend on each other to survive.

Corals have a symbiotic relationship with microscopic algae called zooxanthellae that live in their tissues. These algae provide their host coral with food and give them their colour.

2 STRESSED CORAL

If stressed, algae leave the coral.

When the symbiotic relationship becomes stressed due to increased ocean temperature or pollution, the algae leave the coral's tissue.

3 BLEACHED CORAL

Coral is left bleached and vulnerable.

Without the algae, the coral loses its major source of food, turns white or very pale, and is more susceptible to disease.

4 DEAD CORAL

Coral is left bleached and vulnerable.

Without enough plant cells to provide the coral with the food it needs, the coral soon starves or becomes diseased. Soon afterwards, the tissues of the coral disappear and the exposed skeleton gets covered with algae.

CHANGE IN OCEAN TEMPERATURE

Increased ocean temperature caused by climate change is the leading cause of coral bleaching. Water temperature higher than the average summer maximum – just 1°C higher for four weeks can cause bleaching.

RUNOFF AND POLLUTION

Storm generated precipitation can rapidly dilute ocean water and runoff can carry pollutants - these can bleach near shore corals.

OVEREXPOSURE TO SUNLIGHT

When temperatures are high, high solar irradiance contributes to bleaching in shallow-water corals.

EXTREME LOW TIDES

Exposure to air during extreme low tides can cause bleaching in shallow corals.

1. Key Terms

| 1. Key Terms	Description
Industrial Revolution	A time of great change in Britain between 1750 to 1900
Population	The number of people living in a particular place
Invention	Something new which is created, can be an object or an idea
Agriculture	The process of producing food, and fibers by farming of certain plants or raising animals
Industry	The process of making products by using machines and factories
Mass production	The production of many products at once. Quicker and for less money. e.g. textiles
Sanitation	Sanitation is the system that disposes of human waste
Poverty	The lack of basic human needs such as clean water, nutrition, healthcare, education and shelter
Social	Social is to do with people and the way they live and interact. E.g. The social situation in Britain changed dramatically, 1750-1900
Political	Political is to do with politics and how a country is run. E.g. There were some political changes in Britain, 1750-1900
Economic	Economic is to do with money; how money is made, how much there is. E.g. The economic situation in Britian changed massively, 1750-1900

2. What did the Industrial Revolution mean for Britain?

From 1750 Britain went through a process of change in a number of key areas:
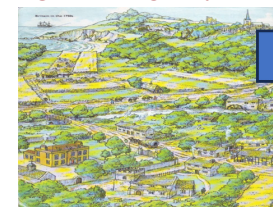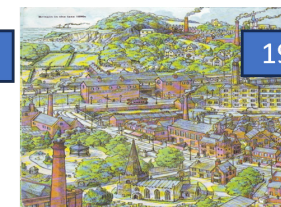
1750   1900

- **Agriculture:** New tools, fertilizers and harvesting techniques were introduced, resulting in increased productivity and agricultural prosperity.
- **Industry:** factories sprung up all over the country creating more efficient ways to produce goods such as wool, cotton and coal. The increase in factories brought thousands of new jobs.
- **Transport and communications:** Thomas Telford built roads and canals in the 1700s and George Stephenson and Isambard Kingdom Brunel oversaw the 'Railway Mania' of the 1800s. There had previously been no very fast way of transporting goods and people around the country.
- **Technology:** Many scientific discoveries and technological inventions that changed society and industry. Changes to sanitation and medical treatment such as the work of John Snow and Edward Jenner improved people's quality of life.

Factory working conditions:

- **Long working hours:** normal shifts were usually 12-14 hours a day, with extra time required during busy periods.
- **Low wages:** a typical wage for male workers was about 15 shillings (75p) a week, but women and children were paid much less, with children three shillings (15p). For this reason, employers preferred to employ women and children.
- **Cruel discipline:** there was frequent "strapping" (hitting with a leather strap) or dowsing them in water butts to keep them awake.
- **Accidents:** forcing children to crawl into dangerous, unguarded machinery led to many accidents and deaths.
- **Health:** The air was full of dust, causing chest and lung diseases and loud noise from machines damaged workers' hearing.

Living conditions:

- **Overcrowding:** due to large numbers of people moving to the cities, there were not enough houses
- **Disease:** typhus, typhoid, tuberculosis and cholera all existed in the cities of England. Overcrowding, low standard housing and poor-quality water supplies all helped spread disease.
- **Waste disposal:** gutters were filled with litter. Human waste was discharged directly into the sewers, which flowed straight into rivers.
- **Poor quality housing:** houses were built very close together (back-to-back housing) so there was little light or fresh air inside them. They did not have running water and people found it difficult to keep clean.
- **Lack of fresh water:** people could get water from a variety of places, such as streams, wells and stand pipes, but this water was often polluted by human waste.

Year 8 Learning Cycle 1 History – What did the Industrial Revolution mean for Britain?

1. 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.)

1852, A Court for King Cholera. From Punch Magazine

2. 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.

1. Key Terms	Description
Transatlantic Slave Trade	The trading in enslaved people who were taken from their homes in Africa across the Atlantic to the West Indies/America
Economic	Economic is to do with money; how money is made, how much there is. E.g. The economic situation in Britian changed massively, 1750-1900 largely due to the slave trade
Mansa Musa	Mansa Musa was emperor of the West African Mali Empire – and the richest person who ever lived
Enslaved	To have all your rights taken away from you and to become the property of someone else
Dehumanisation	Taking away from a person or group their positive human qualities
Olaudah Equiano	Olaudah Equiano was taken into slavery at the age of 12 and eventually bought his own freedom. He became a leading part of the UK abolitionist movement
Abolition	Ending of slavery
Abolitionist	Someone who worked to end slavery
Resistance	Refusing to accept or comply with something; the attempt to prevent something happening by actions or arguments
William Wilberforce	William Wilberforce was an MP who made speeches against slavery in Parliament
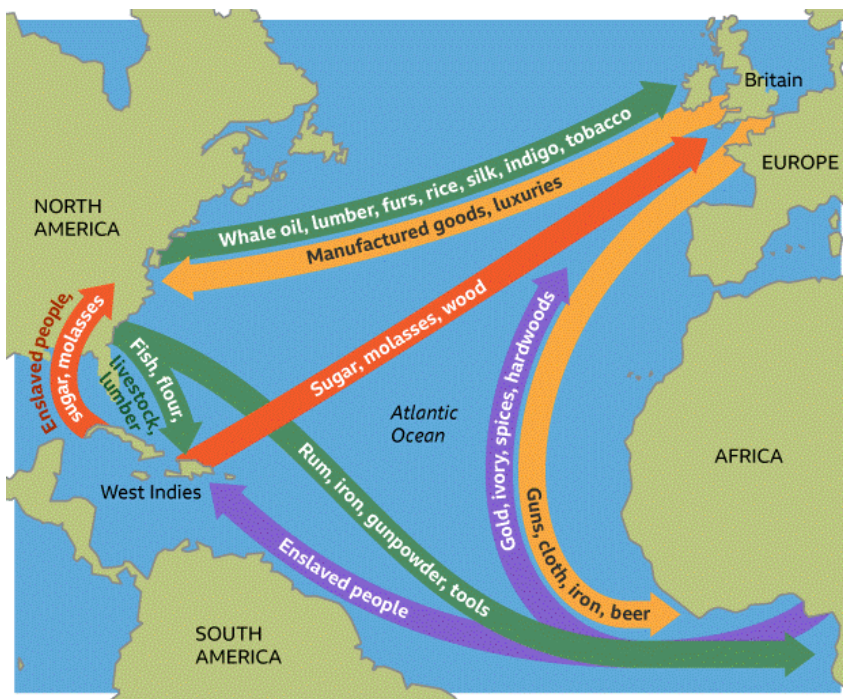
After 1700, the numbers of enslaved people being transported increased greatly. Perhaps 8.5 million African people were enslaved and taken to the Americas.

This image shows how trade was global and involved large numbers of countries and different industries.

2. Abolition:

At the end of the 18th century, public opinion began to turn against the slave trade.

- Some African rulers refused to sell enslaved people to the traders. Occasionally African villages attacked British slave ships and set the captives free.
- Sometimes enslaved people mutinied on board ships. The most famous case was the Amistad in 1839, where enslaved African people took control of the slave ship. Put on trial in the United States, the enslaved people won their freedom.
- There were many rebellions by enslaved people. The most famous leader was **Toussaint l'Ouverture**, who led a successful revolution to liberate the West Indies territory of Saint Domingue from French control in 1791.
- In Jamaica, runaway enslaved people formed 'Maroon' communities that fought against the British soldiers.
- In 1787, the Committee for the Abolition of the Slave Trade was set up. **William Wilberforce** represented the committee in Parliament.
- There is some evidence that the slave trade was becoming less profitable – the price of buying enslaved people in Africa was rising, reaching £25 in 1800, but the price for selling in the Americas had not risen as quickly and was only £35 in 1800.

Year 8 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. Talking in the past

These are some of the most important verbs in the past. If you know these well, you can talk about most things in the past.

fui = I went

vi = I saw

lo pasé bomba =I had a blast

fue/ era = it was

había = there was/ were

viajé = I travelled

visité = I visited

comí = I ate

Using a time frame is essential. What do these mean?

el año pasado

el verano pasado

en agosto

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. Making Comparisons

A key skill in speaking and writing is effectively comparing two things- this could be activities, places etc.

Watch this video and practice using the structures blow to improve your fluency.

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

más...que = more...than

menos...que = less...than

mejor que = better than

peor que = worse than

5. Expressing your opinion

Expressing and justifying your opinion is an essential skilll. Practise using the structures below on the topics we have been learning

me encanta = I love

me gusta

me flipa ⎫ I Like

me mola

me da igual = I don't mind

odio = I hate

no aguanto = I can't stand

dado que

puesto que ⎫ because

ya que

6. Further Reading

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

How to talk about the past in Spanish:

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

How to use the Spanish present tense with '-ar', '-er' and '-ir' verbs:

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

Year 8 Learning Cycle 1 Computing - Online Safety, Bias & Ethics

1. Key Terms	Description
Data Protection Act	The law that governs the protection of personal data in the UK. It says personal data is private and should only be accessible by authorised people. Personal data must not be kept for longer than is necessary or used in ways not agreed.
Copyright law	The Copyright, Designs and Patents Act 1988 gives the creator of published material the control over the way it is used.
Freedom of Information Act 2000	Legislation introduced to give the public the right to access information recorded by public sector organisations.
Ethics	Having morals and principles and 'doing the right thing', irrespective of profit. Ethical issues in computing include: • ensuring public safety • security of data
Hacker	A person who tries to gain unauthorised access to a computer.

2. Stay safe online by:

❑ Not sharing passwords
❑ Using complex passwords
❑ Check the age for sites and applications
❑ Block, Report and Tell someone if you are concerned.

3. Ethics

Many people around the world use computers and new technologies have provided many improvements in society.

This has raised various ethical, legal, cultural and environmental concerns. It has also highlighted important issues surrounding privacy.

4. Bias

Biased information is information that is written from a particular perspective or point of view.

This could be due to:

❑ personal opinion
❑ a statement that has no factual basis
❑ prejudiced in favour of or against a person, product, situation or idea

Year 8 Learning Cycle 1 Computing - Computer Hardware and the CPU

1. Key Terms

1. Key Terms	Description
Hardware	The physical parts of a computer system, eg a keyboard, hard disk drive or CD drive
Input device	Any piece of computer hardware used to provide data to a computer system
Output device	Any piece of computer hardware used to communicate the results of data that has been processed
Software	The programs, applications and data in a computer system
CPU	Central Processing Unit – 'the brains' of the computer. Manages the instructions from the software
Fetch-Decode-Execute Cycle (FDE)	The cycle used by the CPU to fetch an instruction, decode it and then execute, or do the command
Memory	Computers contain two types of memory read only memory (ROM) and random access memory (RAM)
Secondary Storage	Extra storage can be used to store data needed by the computer, eg Solid State (USB) and Optical (DVD, CD)

2. Mordern Computers

Modern computers

Receive input , process it, produce output

General-purpose: designed to automate any process, as specified by a program

The data and instructions to be performed can be stored in memory .

The computer is the only appliance that can do more than one thing. **We use Software to program the computer to do things: play games, create art, listen to music.**

A computer is general purpose – it doesn't have a specific, well-designed purpose, the software is used to define what it does.

Compare this to a toaster - Toasters only toast – they are specialised, but the computer can do hundreds of tasks.

3. History of Computing

Ada Lovelace was the first person to write computer programs. She predicted that one day machines would do more than just maths.

Alan Turing created machines during the war. They helped people read secret coded messages.

Charles Babbage designed a machine called the Analytical Engine 200 years ago. If it had been built this machine would have been the first modern computer.

Year 8 Learning Cycle 1 Computing - Representing Data

1. Binary Digits

Key Words	Definitions
Switch	Early computers used simple switches to store data. The switch was either ON or OFF
Binary Numbers	Binary is a number system that only uses two digits: 1 and 0. All information that is processed by a computer is in the form of a sequence of 1s and 0s
Base 2	Binary is also known as base 2 because there are only 2 possible numbers for each digit

2. Units of measurement

Measurement	Abbreviation	Conversion
bit	b	1 bit
Byte	B	8 bits
Kilobyte	KB	1000 bytes
Megabyte	MB	1000 Kilobytes
Gigabyte	GB	1000 megabytes
Terabyte	TB	1000 gigabytes
Petabyte	PB	1000 terabytes

3. Numbers in binary

Key Words	Definitions
Denary	This is the number system normally used, also called decimal. It uses 10 digits, 0-9
Place Value	Converting between Binary and Denary requires the use of place value

128	64	32	16	8	4	2	1	Denary
0	0	0	0	0	0	0	1	1
0	0	0	0	0	0	1	0	2
0	0	0	0	0	0	1	1	3
0	0	0	0	0	1	0	0	4
0	0	0	0	0	1	0	1	5
0	0	0	0	0	1	1	0	6
0	0	0	0	0	1	1	1	7

Year 8 Learning Cycle 1 Computing - Using Binary

1. Binary Addition

There are four rules that need to be followed when adding two binary numbers. These are:

0 + 0 = 0	Zero + zero = zero
1 + 0 = 1	One + zero = one
1 + 1 = 10	10 in binary = 2 in denary
1 + 1 + 1 = 11	11 in binary = 3 in denary

The rules can be used to add larger binary numbers:

8	4	2	1
	1	1	0
	1	1	1
1	1	0	1
1	1		

1 is carried to the next column

2. Boolean Logic

1. Key Terms	Description
Boolean	Boolean logic is a form of algebra where all values are either True or False
Condition	In computing, this is a statement or sum that is either true or false. A computation depends on whether a condition equates to true or false
Truth Table	AND considers two (or more) conditions. The result is True if the result of all comparisons is True. OR considers two (or more) conditions. The result is True if either comparison is True

AND

A	B	Result
FALSE	FALSE	FALSE
FALSE	TRUE	FALSE
TRUE	FALSE	FALSE
TRUE	TRUE	TRUE

OR

A	B	Result
FALSE	FALSE	FALSE
FALSE	TRUE	TRUE
TRUE	FALSE	TRUE
TRUE	TRUE	TRUE

Year 8 Learning Cycle 1 Computing - Representing Data

1. Designing code using Python

Key Terms	Description
Algorithm	Logical instructions for carrying out a task -needed to design computer programs
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
Variable	A memory location within a computer program where values are stored. The value can be changed during the program
Flowchart	A diagram that shows a process, made up of boxes representing steps, decision, inputs and outputs
Errors	**Syntax errors** occur when you write something incorrectly. The IDLE will give you an error message **Logic errors** are when there is a mistake in the design of the code
Testing	The purpose of testing is to ensure the code meets the design requirements

this is a comment. Comments are useful to help others understand what your code does

MyAge = 13

#this is a variable

print("My age is:", MyAge)

#this prints a message to the screen

Name = input()

#this waits for the user to enter information and then adds it to the variable Name

2. Creating with Scratch – Sequence and Variables

Sequence	a set of instructions that follow on one from another
Selection	A choice in the code. Uses: If...then...else
Flow diagram/chart	A Flowchart can be used to describe an algorithm

Flowchart showing sequence

Flowchart showing selection
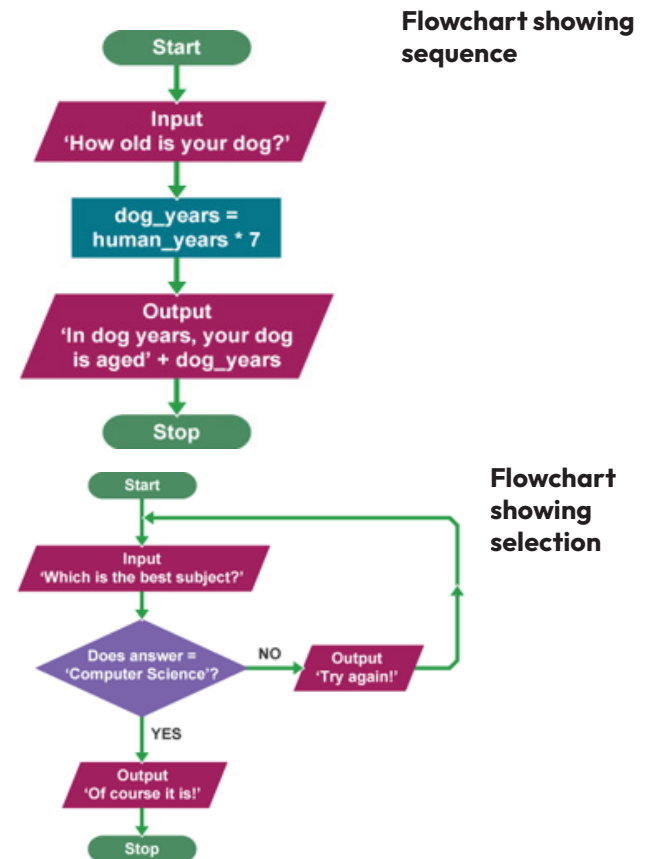
Year 8 Learning Cycle 1 Art

1. Tier Three Vocabulary

| Key Words	Definitions
Simplified	To remove detail, tone and fuss to create a simple shape or line
Monochrome	No colour
Stylized	Depicted or treated in a mannered and on-realistic style
Graphic	Shape that is flat and simple
Lino	Plastic materials that can be carved into to create a print
Reduction Lino	Carving back into the lino to print more than one colour

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 print. You will learn how to create a repeat pattern.
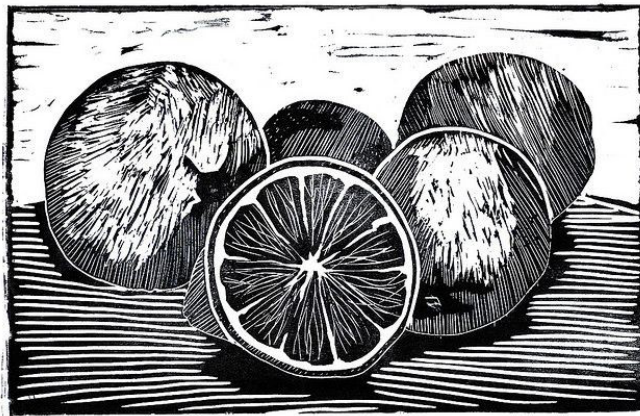
3. Natural Forms Art

You will be introduced to artists, illustrators and photographers that use natural forms and the natural world to inform and inspired their work. How they use the formal and visual elements such as line, shape, tone, texture, and colour. You will use these skills to develop your designs inspired by a range of artists and printmakers.
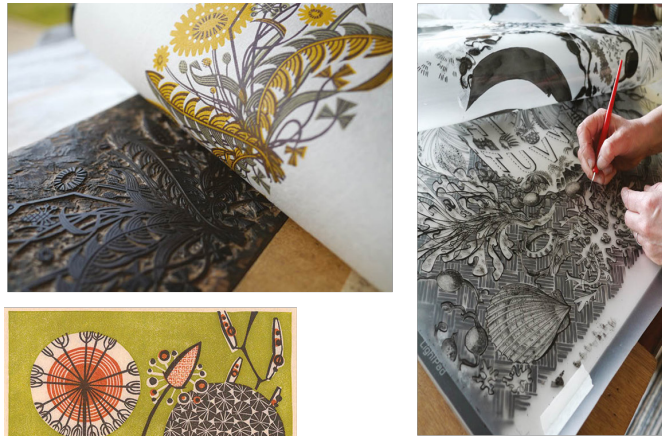
Scientific illustration was used before photography to record and study detail in the natural world.

4. Artists that make Marks

Angie Lewin

Lewin lives in Scotland and is inspired by her surrounding landscape. She use lino printing.

Ernst Haeckel

Ernst Haeckel was a scientist that observed natural forms and drew them in extraordinary detail.

Karl Blossfeldt

Blossfeldt was a pioneer of photography and was inspired by natural forms.

5. Links and Further Reading

Angie Lewin Research Information

is.gd/angielewin

Enrst Haeckel

is.gd/ernsthaeckel

1. Tier Three Vocabulary

Key Words	Definitions
Lever	A simple machine consisting of a pivot, effort and load
Pivot	A point around which something can rotate or turn
Trebuchet	A type of catapult that uses a long arm to throw a projectile
Projectile	An object that is propelled (moved) by a force
Mathematical modelling	Using data and formulae to predict the outcome for a real-world problem
Reproducible	The same results can be obtained by another team using the same equipment
Linkage	A mechanism made by connecting together rigid links or levers
Mechanical advantage	Increasing the size of a force by using a mechanism such as a lever
Accuracy	How close your object lands to the target
Optimum	The best conditions
Configuration	The settings used for your trebuchet

2. Factors that affect distance rocket travels

Effort	The greater the force used to turn the arm of the trebuchet, the further the projectile can go	
Load	The greater the mass of the load (projectile) being thrown by the arm of the trebuchet, the less distance it will travel	
Length of the arm	The longer the arm of your trebuchet, the greater the potential mechanical advantage	
Position of the pivot	The further the effort is applied from the pivot, the greater the turning effect of the force	
Distance the load is from the pivot	The greater the distance of the load from the pivot point, the more effort will be needed to move it	
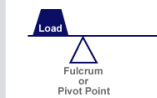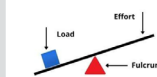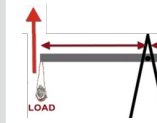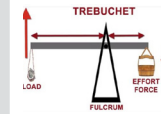
3. Mathematical Modelling

Measuring and using performance data from scaled-down models allows designers to predict how the full-size products will perform. Also, the forces likely to be experienced, so materials with the correct strengths can be selected.

Design and technology should be the subject where mathematical brainboxes and science whizzkids turn their bright ideas into useful products.

James Dyson

4. Efficient Testing

Think how you might design an investigation in Science...

- Be methodical by planning to select and change only one factor of your trebuchet settings at a time.
- Record your results in a suitable table.
- Consider repeating your results to check to see if they are similar each time before changing another factor.

5. 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 away with your hand.
5. Don't touch tools without permission from the teacher

6. Links and further reading

Modelling:
https://www.bbc.co.uk/bitesize/guides/z6jkw6f/revision/9

Trebuchets:
https://www.youtube.com/watch?v=9-Hwxw4fgqk

Revise:Mindmap Maker
is.gd/mindmapmaker

1. Key Terms

1. Key Terms	Description
Hygiene	Keeping things clean and germ-free to prevent getting sick from food and maintain a healthy environment
Anaemia	A condition where a person doesn't have enough healthy red blood cells, usually caused by not having enough iron
Hazard	Something that can be dangerous or harmful, especially when it comes to working with food, like sharp objects or spoiled ingredients
Micronutrients	Tiny nutrients that our bodies need in small amounts, like vitamins and minerals, to stay healthy and function properly
Critical Control Point	A specific step in food preparation where it's crucial to take extra care to prevent foodborne illnesses, like cooking meat thoroughly
Carbohydrates	Nutrients found in foods like bread, pasta, and fruits that give us energy to do things
Starch	A type of carbohydrate found in foods like potatoes and rice that provides long-lasting energy
Fats/Lipids/Oils	Nutrients found in foods like butter, oils, and avocados that provide energy
Coagulation	When a liquid, like egg whites, turns into a solid or semi-solid state, usually through heat or the addition of certain ingredients
Denaturation	Changing the structure of a protein, usually by heat or chemicals, which can affect its texture and properties

2. Nutrition at different life stages

Babies	Babies rely on breast milk or formula as their primary source of nutrition, providing them with essential proteins, carbs, fats and minerals for growth and development
Children	Toddlers require a balanced diet with protein, carbs, fats, vitamins and minerals from varied food sources such a fruit and vegetables, whole grains and dairy. They need to eat from all major food groups
Adolescents	Teenagers experience rapid growth and increased nutrient demand with a focus on protein, carbs, fats, calcium and iron. Intake of calcium for bone health and blood production is particularly important
Adults	Adults require a balanced diet that provides them with the necessary nutrients for energy, maintenance, and overall well-being. A diverse mix of foods that provide the right mix of proteins, carbs, healthy fats and minerals from a diverse range of foods
Elderly	A nutrient-rich diet is essential, focusing on protein intake to maintain muscle mass, calcium and vitamin D for bon health, fibre for digestive function

3. Eatwell guide

The Eatwell Guide is a great way of ensuring that you get a balance of healthier and more sustainable food. It shows how much of what you eat overall should come from each food group.
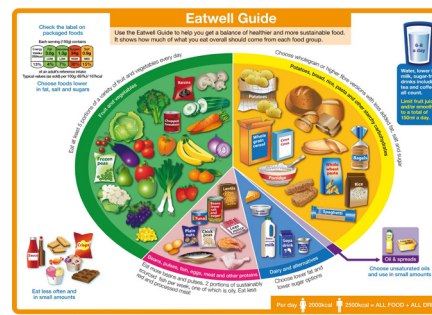
4. HACCP

It's a way that people in the food industry use to make sure the food they make is safe to eat. They look at all the steps involved in making the food and figure out where there could be problems. Then they come up with ways to prevent those problems and check to make sure everything is going well. It helps them keep the food they make as safe as possible for everyone to enjoy.

5. Teenage Diet

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 8 Learning Cycle 1 RE - Islam

1.Key Words	Definitions
Islam	The religious faith of Muslims including belief in Allah as the sole god and in Muhammad as his prophet
Muhammad	Muhammad was the founder of Islam and according to Islam he was the prophet and God's messenger
Quran	The Qur'an is the holy book for the Muslims, revealed in stages to the Prophet Muhammad over 23 years
Mosqu	The mosque is a place to gather for prayers, to study and celebrate festivals such as Ramadan
Allah	Muslims believe made everything, knows everything and is all-powerful, so human beings must worship him
Hajj	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
Ramadan	Muslims give up food, liquid and smoking between the hours of daylight for 29 or 30 days of Ramadan
Prophet	A prophet is an individual regarded as being in contact with god and said to speak on their behalf
Fasting	Fasting is the willing stop or reduction from some or all food, drink, or both, for a period of time
Kabaa	The Kaaba is built around a sacred black stone, a meteorite that Muslims believe is a symbol of God's covenant
Arabic	The language of Islam is Arabic
Eid ul-Fitr	Eid al-Fitr is an important religious holiday celebrated by Muslims worldwide that marks the end of Ramadan, the Islamic holy month of fasting
Mecca/Makkah	The most sacred place in Islam is the Kabaa in Mecca, Saudi Arabia, where all followers of I slam pray towards
Wudu	Wudu is the Islamic procedure for washing parts of the body, a type of religious cleansing before prayer
Imam	Imam is an Islamic leader thats is most commonlyu used as the title of a worship leader of a mosque and Muslim community
Muslim	A Muslim is someone who follows or practices Islam

2. What is What is Islamophobia?

The Islamic word for God is Allah. The word "Islam" means submission to God's will and obedience to God's law. It comes from an old Arabic word meaning "peace."

Some people have blamed all Muslims for recent terrorist attacks carried out by extreme groups who say they follow the religion of Islam. Hating someone or treating them differently because they are a Muslim is called "Islamophobia".

But, many people say those terrorist groups have extreme beliefs of hatred and violence that have little to do with what most Muslims believe.

They say it is important not to blame a big group of people for what a small number of individuals have done.

Islamophobia can result in Muslims being targeted, whether in person or online. They can be badly treated, insulted or even physically hurt.

Many people think Islamophobia is created when a person doesn't properly understand what Muslims do or believe, and that the best way to combat it is to have a better understanding of Muslims and Islam.

Use this QR code to watch a Newsround article on Islamophobia

SCAN ME

When writing the name of the Prophet Muhammad, Muslims often follow it with the abbreviation "PBUH." These letters stand for the English words " peace be upon him." Muslims use these words to show respect to one of God's Prophets when mentioning his name.

Year 8 Learning Cycle 1 RE - Islam

3. The 5 Pillars of Islam

The most important Muslim practices are the Five Pillars of Islam.

The Five Pillars of Islam are the five obligations that every Muslim must satisfy in order to live a good and responsible life according to Islam.

Islam has five basic duties which Muslims must perform. These are called the five pillars of Islam.				
Shahadah (Belief in Allah)	**Salah** (Prayer)	**Zakat** (Giving to charity)	**Sawm** (Fasting)	**Hajj** (Pilgrimage)
A declaration of faith in Allah that Muslims remember all the time.	Saying prayers to Allah five times a day.	Giving 2.5% of their income each year to support the poor.	Not eating during daylight hours for the month of Ramadan.	A journey to Makkah that Muslims should undertake at least once in their lives.

Carrying out these obligations provides the framework of a Muslim's life, and weaves their everyday activities and their beliefs into a single cloth of religious devotion.

Carrying out the Five Pillars demonstrates that the Muslim is putting their faith first, and not just trying to fit it in around their secular lives. Secular means not connected with religion.

4. The Qur'an

Basic Facts about The Qur'an

The Qur'an is the holy book for Muslims. It is written in Arabic. Muslims believe that no part of the Qur'an can be changed or rewritten because it is the word of God and so it is perfect.

Where did the Qur'an come from?

Over a period of 23 years God (Allah in Arabic) revealed his message through the archangel Gabriel to Muhammad. The message was to worship the one true god. These revelations were written down by his companions (Muhammad was illiterate) to form the Qur'an. Muslims believe the Qur'an is the final book to be revealed by Allah after a collection of other books including the Torah and the Bible.

What is written in the Qur'an?

The Qur'an has rules and laws written in it about believing In one God, prayer, charity, fasting, what types of food are and are not allowed to be eaten. It explains about marriage, divorce, buying and selling, crimes and punishments and many more. Many Muslims around the world learn the whole Quran off by heart. A Person who does this is called a Haafiz/Hafiz. Muslims believe that whoever is able to this is very clever and can teach others how to read the Quran.

How do Muslims show respect the the Qur'an?

Because Muslims believe the Quran is the word of God they do the following to show their love and respect for it:

1. They perform Wudu (a special way of washing themselves) which involves washing their hands, faces, arms and feet.
2. Copies of the Qur'an are sometimes kept wrapped up in a cloth, and they are always placed on a high shelf in order to keep it safe and to show respect.
3. They put it on a special stand so that it doesn't touch the floor as the floor can be a dirty place

# Year 8 Learning Cycle 1 Music - It's Elementary

1. Key Words

Key Words	Definitions
Chord	A chord is a group of notes (usually three or more) played together at the same time
Chord Diagram	A picture or drawing that shows how to place your fingers on an instrument, like a guitar or piano, to play a specific chord
Genre	Different styles or types of music, like pop, rock, jazz, or classical, that have their own unique sound and characteristics
Harmony	When different notes or chords are played together in a way that sounds pleasing
Structure	How a song or piece of music is organised and put together (verse and chorus, or ABA for example.)
Major Chord	A chord that is happy-sounding made up of three specific notes played together
Minor Chord	A chord that is sad or moody-sounding made up of three specific notes played together
Semitone	The smallest distance between two notes. This would be moving immediately up or down from a note
Tone	The distance between two notes that are two semitones apart

2. Chord Diagrams

The picture below shows all the different features of a chord diagram and how to read one.
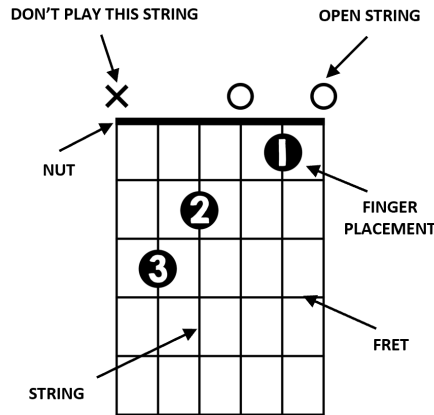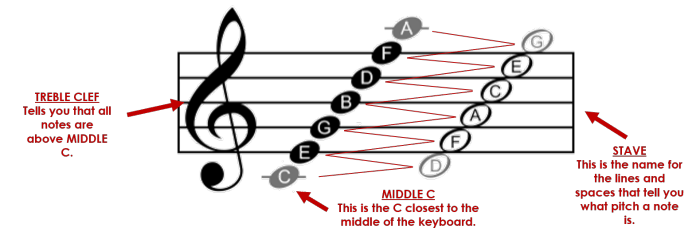

3. Major and Minor Chords
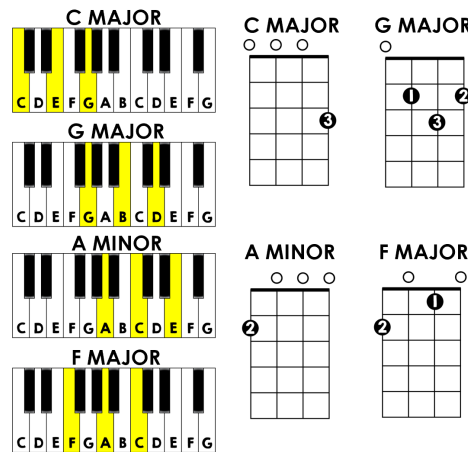
4. Symbols and Pitch Notation

Although the notes go up in alphabetical order, a nice way to remember the notes for the TREBLE CLEF is to separate the notes on a line and the notes in the spaces.

The notes on the lines spell out EveryGoodBoyDeservesFood, and the notes in the spaces spell out the word FACE.

5. Chord Numbers

When music is played, we decide which key we start in. Once we know which key we are in, we describe the chords in that key with roman numerals. For example, in C major, chord 1 would be 'C', chord 2 would be 'D', chord 3 would be 'E' etc. But how do we know whether it is D major or E minor?

If the roman numeral has capital letters it is a major chord, if the roman numeral has lowercase letters, then it is a minor chord. Depending which key you are the order of major and minor chords would be different:
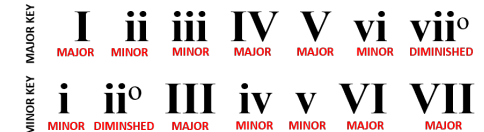
6. Links and Further Reading

How to Read Guitar Chord Charts
is.gd/chordcharts

Article:BBC Concert Orchestra Wows Young Audience
is.gd/orchestraarticle

Revise:Mindmap Maker
is.gd/mindmapmaker

Year 8 Learning Cycle 1 Drama - Oliver Twist

1. Key Words

Key Words	Definitions
Still Image	Where the actors freeze onstage in a given moment in order to communicate meaning or mark a moment
Thought Track	When a character steps out of a scene to address the audience about how they're feeling
Hot Seating	A character is questioned by the audience or students. The actor must answer in role
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

3. Characters

Character	Description
Oliver Twist	The hero and protagonist of the story. He is an orphan, and his true identity is hidden from the reader until the end. An innocent and vulnerable character, who has been treated cruelly by those around him. However, even when he is treated badly, Oliver stays true to himself and is kind to everybody
Artful Dodger	Streetwise, clever and mischievous; he is Fagin's best pick pocketer and also the person who introduces Oliver to Fagin
Fagin	Fagin is the leader of the pick pocketers, taking in orphans and training them to pick pocket for him. He rarely commits crimes himself and instead uses other people, so he does not get caught. In the story, he tries to turn Oliver into a thief
Bill Sykes	The antagonist of the story. Bill Sykes is a professional burglar and a very violent and cruel man. He was also once a pickpocket in Fagin's group and was brought up surrounded by crime. He is always accompanied by his loyal dog 'Bullseye'
Nancy	Nancy was once one of Fagin's pickpockets when she was younger and has since grown up with crime all around her. Despite this, she has a good heart and is one of the noblest characters and a friend to Oliver
Mr Bumble	A church official who worked in the workhouse where Oliver was born. Although he believes that he is righteous and good, he treats Oliver and the other children under his care with cruelty
Widow Corney	A cruel and power-hungry woman that does anything she can to make the orphans livs more of a misery

2. Plot

Oliver! takes audiences on a wild adventure through Victorian England. Young, orphaned Oliver Twist navigates through London's underworld of theft and violence, searching for a home, a family, and - most importantly - for love.

When Oliver is picked up on the street by a boy named the Artful Dodger, he is welcomed into a gang of child pickpockets led by the conniving, but charismatic, Fagin. When Oliver is falsely accused of a theft he didn't commit, he is rescued by a kind and wealthy gentleman, to the dismay of Fagin's violent sidekick, Bill Sikes. Caught in the middle is the warm-hearted Nancy, who is trapped under Bill's thumb, but desperate to help Oliver, with tragic results.

4. Context

Charles Dickens began writing the novel Oliver Twist after the adoption of the Poor Law of 1834, which stopped government payments to the able-bodied poor unless they entered workhouses. Therefore, Oliver Twist became a story clearly aimed directly at the problem of poverty in 19th-century London.

The novel was the first of the author's works to realistically depict the impoverished London underworld and to illustrate his belief that poverty leads to crime.

Oliver Twist was adapted by Lionel Bart as 'Oliver!' a stage musical, and opened in the West End in 1960. The musical film starring Mark Lester came shortly after, in 1968.

Oliver! Is still an extremely popular musical today.

5. Links and further reading

'Consider Yourself' 1968 Film
https://www.youtube.com/watch?v=wZxky51fxCg

Context Summary
https://www.britannica.com/topic/Oliver-Twist-novel-by-Dickens

Video Plot Summary
https://www.youtube.com/watch?v=D0I8QfERkEw

Notes Pages

Notes Pages

Notes Pages

Notes Pages

Notes Pages