Year 9

Knowledge Organiser

September- December 2024

AMBITION, CONFIDENCE, CREATIVITY,
RESPECT, DETERMINATION

Proud to be part of the GREENSHAW LEARNING TRUST

FIVE ACRES HIGH SCHOOL

Why do we have knowledge organisers?
Knowledge organisers are a collation of the basic essential knowledge for success in each subject area that will underpin your learning for the term.

They are designed to provide the information you will need to be committing to your long term memory through recall exercises in Low Stakes Quizzing.

How do we use knowledge organisers?
You should be using these KOs to create your homework quizzes so that you are practising retrieving information.

1. You can do this by testing yourself on the definition of key terms (both recalling the key term and then swapping to recall the definition), practice labelling diagrams, retrieves reasons and justifications for the main learning points.
2. They can also be used for 'memory dumps' where you try to recall as much of the information about a topic as possible and then use the KP to fill in the gaps.
3. They can also be used in class to assist with retrieval of the core knowledge needed for each subject.

You should have these with you at all times in school and out on your desk in all lessons.

If you lose your KO or it becomes too dishevelled, please purchase a new one from the Head of Year or the School Office.

Contents

Year 9 Autumn Term Conflict

Key Vocabulary

- **Futility** Pointless (Latin – futilis – leaky, futile)
- Brutality Savage physical violence (Latin – brutus – heavy, dull, stupid, insensible, unreasonable)
- **Nationalism** Devotion to your country (French – nacion – peculiar or commen to the whole people of a country)
- **Insubordination** Defiance of authority (French – insubordine in – not subordinate – submitting to authority)
- **Subvert**To undermine or overturn (Latin – subvertere – to turn upside down)
- **Invert** To reverse the position (Latin – invertere – turn about, upset, reverse)
- **Neuralgia** Pain caused by the nerves (Greek – neuron – nerve algia – pain)
- **Claustrophobic** Feeling of fear linked to being in a confined place (Latin – cloister – to close phobia – fear)
- **Vernacular** The language or dialect spoken by the ordinary people of a region (Latin – vernaculus – domestic, native, indigenous)
- **Poignant** Evoking a keen sense of sadness or regret (French – poignant – sharp, pointed)
- **Futility** Pointless (Latin – futilis – leaky, futile)
- **Brutality** Savage physical violence (Latin – brutus – heavy, dull, stupid, insensible, unreasonable)

Context about the playwright Sheriff

Journey's End was based on his real experiences as an army officer fighting in WW1. Educated at Kingston grammar school, he served as an officer in the 9th Battalion of the east Sussex Regiment. He was severely wounded as Passchendale, near Ypres.

Context and key terms

World War One: 1914-1918. Considered one of the most brutal and bloodiest conflicts in history.

Propaganda: Convinced young soldiers to sign up- that fighting in WWI was noble. Also presented Germans as evil monsters.

Vimy Ridge: A horrific battle whereby commanding officers ordered their soldiers to run at German machine guns.

The play: Set in the vicious trench warfare of World War One. The action begins on the evening of Monday 18 March 1918 and continues over three days.

Shell Shock: Nowadays known as 'post-traumatic stress disorder'. Soldiers were effectively paralysed with fear.

Superior officers: Soldiers were expected to follow the command of their superior officer, regardless of how daft the order was. Any refusal (also known as insubordination) would result in being court marshalled and shot.

The Boche: Germans, especially German soldiers, considered collectively; from the French word for rascal.

Minnies: Large mortar shells, named for the German **Minnywerfer:** short range german shell mortars

Trenches: Long, narrow ditches dug by troops to provide shelter from enemy fire; also shorthand for the battlefields of France and Belgium in WWI.

Jerry: Slang term for Germans

No Man's Land: Disputed land between the front lines or trenches of two opposing armies.

Poisoned gas: chemical warfare including tear gas, chlorine (which characteristically smelt like pepper and pineapple) and phosgene which smelt like musty hay. The latter were highly toxic.

Kaiserschlacht: German spring offensive in March 1918, part of their 'final push' on the Western Front.

Symbolism and Motifs

Time: There are constant references to time and 'waiting' throughout the play- to reflect the boredom of life in the trenches and reality of the front.

Light: Through the play, the light in the trenches becomes increasingly dim- to reflect either the darkening mood or increasing lack of hope. After Osborne's death, artificial light (the dugouts is 'festively lit with candles') to symbolise the artificial 'happiness' of Stanhope.

Osborne's Pipe: Osborne has to leave his pipe, unfinished and whilst it still has a 'glow' on it, to go on the raid- which is symbolic for how his and other soldiers' lives were cut short.

Earwigs: If you dip an earwig in whiskey it will go faster- just like a soldier.

Uniforms: Used to reflect the characters' mental states. Stanhope's is tidy but 'war-stained', whilst Raleigh's is 'fresh'. However, after the Raid his too has become war-stained. This is symbolic for the minds of the soldiers.

Ramshackle furniture: used by Sheriff to symbolise the ill equipment of poor treatment of the serving soldiers by the Governemnent.

Social class: sheriff comments on social class presenting the officers as middle and upper class whilst the orderly (Mason) is clearly working class. The exception to this is Trotter, who is treated poorly.

Well made play : majority of the action takes place before the play begins. The play consists of 3 acts, the ending is often ambiguous. This was an accepted dramatic form of the late 19th and early 20th century.

Key vocabulary and terminology

Assonance – repetition of a vowel sound of emphasis
Atmosphere- mood or feeling
Couplet – 2 lines of rhyming poetry
Caesura- punctuation in the middle of a line for emphasis
Dramatic monologue- narrative told only from the narrator's viewpoint
Enjambement- overlapping sentence into the following the line.
Extended metaphor – metaphor running through the poem rather than singular reference
Form- the shape of a poem
Free verse- poem that does not have a regular rhyme structure
Half rhyme- partial rhyme scheme
Iambic pentameter – 10 syllables with 5 stressed syllables
Narrative- account of events
Oxymoron – contradictory placement of words – eg bitter sweet
Prose- any writing not in verse form
Rhyme scheme – pattern of rhyming eg ABAB
Simile – comparison to enhance understanding using like or as
Sonnet form- 14 lines in iambic pentameter. Either **Italian/Petrarchan** or **English/Shakespearean**
Octet – 8 lined stanza (posing the problem or question in a Patrarchan sonnet.
Sestet –(6 lines stanza, often presenting the answer or question to the octet)
Cinquain/quintet – 5 line stanza
Quatrain/quartet – 4 line stanza
Tercet- 3 line stanza
Volta- turning point of a sonnet between the octet and the sestet (Line 9)
Natural imagery – imagery inspired by nature

Yr 9 KO Autumn Term Conflict Poetry

Evaluative Verbs

Satirises – using satire (a way of criticising people or ideas in a funny way) to show that people or ideas have bad qualities and are wrong - usually political.
Presents – introduces an idea.
Demonstrates – provides a clear explanation or example.
Amplifies – emphasises using extra impact and returning to the same idea/point. It makes this idea/point seem very important.
Conveys- carries or presents
Contrasts – presents ideas in opposition
Insinuates – hints at, implies.
Alludes to- references or suggests

Language of comparison:

- Similarly, likewise, additionally, also.
- However, although, conversely, contrastingly.

Phrases to show writer's purpose:

- The writer is inviting the reader…
- The writer is perhaps suggesting…
- The writer indicates that…
- The writer has used this to…
- Phrase to show comparison of effect on the reader:
- Similarly, this also makes the reader…
- Conversely, the reader then feels…

The poems :

Dulce et Decorum Est – Wilfred Owen

A damning, realistic and brutal portrayal of life in the trenches during WW1

Exposure – Wilfred Owen

Another presentation of the harsh realities of existing in the trenches during WW1

The War Photographers – Frank Ormsby

A visual representation of the destruction caused by ward

War Photographer

Carol Ann Duffy Duffy's poem was inspired by a photo journalist and the fine line between observing and involvement.

What every soldier should know Brian Turner

He fought in the Iraqi war. Often autobiographical, his poems portray terror, compassion and loneliness of armed conflict.

A Dead Boche Robert Graves

Graves served three times in the first world war,discharged after his third wounding. He known for his damning accounts of the Western Front.

Mametz Wood Owen Shears

Portrays a fierce WW1 battle in the Somme between the Germans and a Welsh infantry division. The Welshmen were never truly acknowledged for their sacrifice

The Manhunt Simon Armitage

Armitage writes this poem after researching accounts of war and survival and reading about Eddie (a soldier who witnessed the Srebrenica massacre) and Laura, his wife.

AB Negative Brian Turner

The poem is in 3rd person and describes a field surgeon's effort to save a female soldier.

Y9 Autumn Knowledge Organiser Search sparx codes in KS3 if starting with M and GCSE if starting with U at sparxmaths.uk/student/independentlearning

Fractions, decimals and percentages

Topics

- Converting between fractions, decimals and percentages (U888)
- Ordering fractions, decimals and percentages(U594)
- Finding fractions of amounts without a calculator (U881)
- Finding fractions of amounts with a calculator (U916)
- Finding percentages of amounts without a calculator (U554)
- Finding percentages of amounts with a calculator (U349)

Building Blocks

- Finding equivalent fractions (U704)
- Ordering fractions (U746)
- Multiplying fractions (U475)

Keywords

Multiplier - a decimal you multiply by to increase/decrease a number by a percentage.
Numerator - top number in a fraction.
Denominator - bottom number in a fraction.

Percentage change

Topics

- Percentage change without a calculator (U773)
- Percentage change with a calculator (U671)
- Finding original values in percentage calculations (U286)
- Finding the percentage an amount has been changed by (U278)
- Simple interest calculations (U533)

Building Blocks

- Finding percentages of amounts without a calculator (U554)
- Finding percentages of amounts with a calculator (U349)

Keywords

Interest - amount of money paid to you by a bank when you invest savings with them.

Probability

Topics

- Expected results from repeated experiments (U166)
- Calculating experimental probabilities (U580)
- Frequency trees (U280)

Building Blocks

- Writing probabilities as fractions, decimals and percentages (U510)
- Probabilities of mutually exclusive events (U683)
- Finding fractions of amounts (U881, U916)
- Finding percentages of amounts (U554, U349)

Keywords

Probability - likelihood of an event happening, given as fractions or decimals.
Frequency - the number of times something is happening. This is an integer.
Frequency tree diagram - way of representing frequencies .

Y9 Autumn Knowledge Organiser Search sparx codes in KS3 if starting with M and GCSE if starting with U at sparxmaths.uk/student/independentlearning

Standard form

Topics

- Multiplying and dividing numbers in standard form (U264)
- Adding and subtracting numbers in standard form (U290)
- Standard form with a calculator (U161)

Building Blocks

- Using standard form with positive indices (U330)
- Using standard form with negative indices (U534)
- Index rules with positive indices (U235)
- Index rules with negative indices (U694)
- Using a calculator (U926)

Keywords

Index/Indices - number in the power.
Ordinary form - number in whole number or decimal form.
Standard form - number between 1 and 10 multiplied by a power of 10 with index form.

Inequalities

Topics

- Solving inequalities with the unknown on both sides (U738)
- Solving double inequalities (U145)
- Constructing and solving inequalities (U337)

Building Blocks

- Reading and drawing inequalities on number lines (U509)
- Solving single inequalities (U759)

Keywords

Inequality - statement showing two quantities that are not equal.
Coefficient - number in front of the variable including the + or - symbol.

Quadratic equations

Topics

- Factorising quadratic equations of the form x^2+bx+c (U178)
- Factorising the difference of two squares (U963)
- Factorising to solve quadratic equations of the form $x^2+bx+c=0$ (U228)

Building Blocks

- Expanding double brackets (U768)
- Factorising into one bracket (U365)

Keywords

Quadratic - algebraic expression including a squared term.
Factorise - identify the highest common factor from an algebraic expression, place outside brackets and make it equivalent to the original expression.

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Formulae

Topics

- Changing the subjects of formulae (U556)

Building Blocks

- Solving equations with two or more steps (U325)
- Solving equations with the variable on both sides (U870)
- Solving equations with the variable in the denominator (U505)

Keywords

Formulae - equations used to find quantities when given certain values.
Subject - variable that needs to stand by itself after rearranging a formula

Constructions

Topics

- Constructing bisectors of angles (U787)
- Constructing perpendicular bisectors and lines (U245)

Building Blocks

- Using a rule r(M985)
- Using a pair of compasses (M196)

Keywords

Bisector - a line halving a line or angle in size
Perpendicular - lines meeting in a 90 degree/right angle

Circles and cylinders

Topics

- Finding the arc length of sectors (U221)
- Finding the area of sectors (U373)
- Finding the surface area of cylinders (U464)
- Finding the volume of cylinders (U915)

Building Blocks

- Identifying parts of circles (U767)
- Finding the circumference of circles (U604)
- Finding the area of circles (U950)
- Finding the surface area of prisms (U259)
- Finding the volume of prisms (U174)
- Using a calculator (U926)

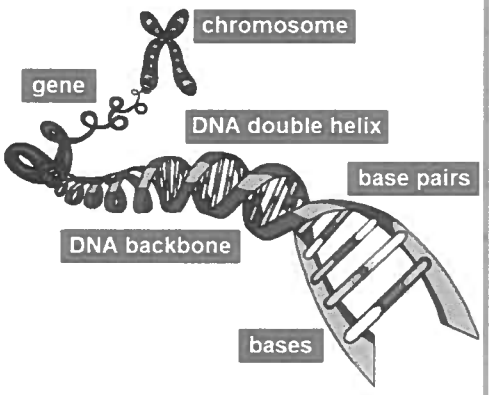
Keywords

Arc - part of the circumference of a circle
Circumference - perimeter of a circle
Sector - part of the area of a circle restricted by two radii and an arc
Cylinder - 3D shape that is a prism with a cross-section of a circle
Surface area - all face areas added up
Volume - space inside of a 3D shape

Year 9 Biology Knowledge Organiser – Genetics page 1

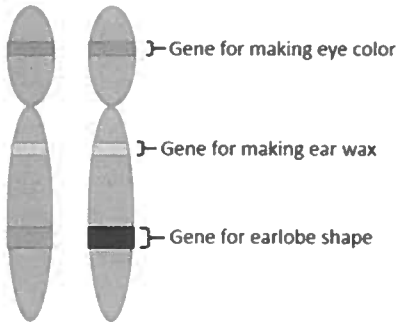
Box 1 - The Gene

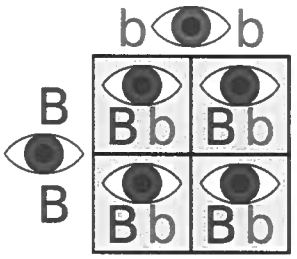
DNA controls many characteristics of organisms. The genetic material in the nucleus of a cell is composed of a chemical called DNA. DNA is made of two strands forming a double helix. DNA has a series of bases which are read as triplets. DNA is contained in structures called chromosomes. A gene is a small section of DNA on a chromosome. Each gene codes for a particular sequence of amino acids. A sequence of amino acids makes a protein. Proteins are the building blocks of cells. Proteins determine certain characteristics.

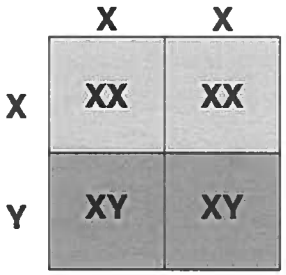


Box 2 - Inheritance

Genes occur in pairs, one of each is inherited from each parent. Some characteristics are controlled by a single gene. Most characteristics are a result of multiple genes interacting rather than a single one. Each gene can have different forms called alleles. Genetic crosses can be completed for those characteristics that are controlled by a single gene, and give a percentage chance of each characteristic being seen in the offspring. A punnett square diagram can be completed for sex determination. Of the 23 pairs of chromosomes in a human nucleus, 22 determine characteristics but only one carries the genes that determine sex. In females the sex chromosomes are the same, XX. In males the chromosomes are XY. Each egg cell holds an X chromosome. Sperm cells contain either an X or a Y chromosome. A punnett square diagram will show there is a 50% chance of each child being either a boy or a girl.







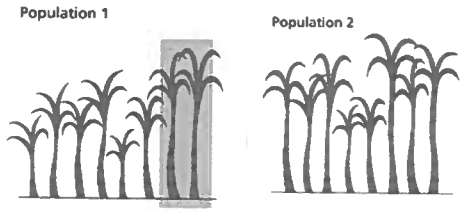
Key Terms	Definitions
DNA	Genetic material in the nucleus of a cell
Gene	A small section of DNA on a chromosome
Chromosome	Structures that contain DNA
Amino acid	Coded for by a gene; building blocks of protein
Dominant	A gene or characteristic that will always be expressed in the offspring
Recessive	A gene or characteristics that will only be expressed in the offspring if the other gene is also recessive
Allele	A form of a gene (e.g. for brown eyes or blue eyes)
Genotype	Genes that are present, e.g. HH, Rr
Phenotype	Characteristics that are present
Homozygous	If the two alleles present are the same, e.g. MM, qq
Heterozygous	If the two alleles present are different, e.g. Mm, Qq
Selective breeding	The process by which humans breed plants and animals for particular genetic characteristics
Clone	An individual that has been produced asexually or artificially and is genetically identical to the parent
Embryo cloning	Process used to clone animals
Evolution	The theory that suggests there has been a development of more complex organisms over millions of years
Natural selection	The survival and successful breeding of organisms most suited to their environment
Fossils	Prints or remains of organisms that have been preserved in rock through a process of mineralisation
Extinction	There are no remaining individuals of a species still alive

Year 9 Biology Knowledge Organiser – Genetics page 2

Box 3 - Selective Breeding

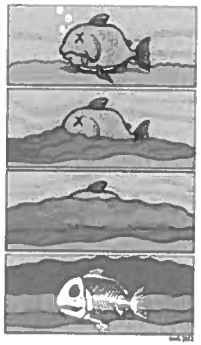
Selective breeding, or artificial selection, is the process by which humans breed plants and animals for particular genetic characteristics. Desired characteristics can include resistance from disease, animals with a high yield of milk or meat, domestic dogs with a gentle nature, large or unusual flowers. Selective breeding can result in "inbreeding" where some breeds are particularly prone to disease from inherited defects.

Selective breeding involves:
1. Breeding individuals who have the desired characteristic
2. From the offspring those with the desired characteristic are bred together
3. Repeating over many generations until all the offspring show the desired characteristic



Box 4 - Fossils and Extinction

Fossils provide evidence of evolution. Fossils are the prints or remains of organisms that have been preserved in rock through a process of mineralisation. Fossil records are often incomplete but allow scientists to understand changes in species over time. Fossils allow us to identify organisms that are now extinct. Extinction occurs when there are no remaining individuals of a species still alive. Human behaviours have increased the rate of extinction as species are unable to adapt rapidly enough to the changes brought about by humans.



Box 5 - Darwin's Discoveries

All organisms have evolved from simple single celled organisms over millions of years. Evolution has occurred due to variation within a species. Variation can either be continuous or discontinuous, and is a result of either genetics, environment or both.
Darwin found evidence of evolution in the 1830s during his round-the-world journey. Darwin coined the term "survival of the fittest" to explain his theory of natural selection:

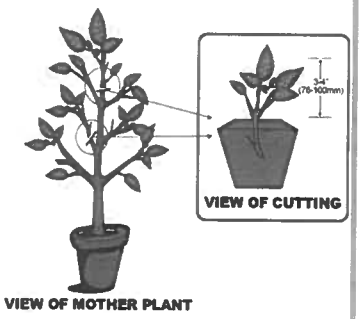
- Individual organisms within a particular species show a wide range of variation for a characteristic.
- Individuals with characteristics most suited to the environment are more likely to survive to breed successfully.
- The characteristics that have enabled these individuals to survive are then passed on to the next generation.

Darwin published his ideas in *On the Origin of the Species* but his ideas were initially rejected by other academics due to existing religious beliefs and a lack of explanation. The idea of natural selection is now widely accepted, since the discovery of the gene provided further evidence.

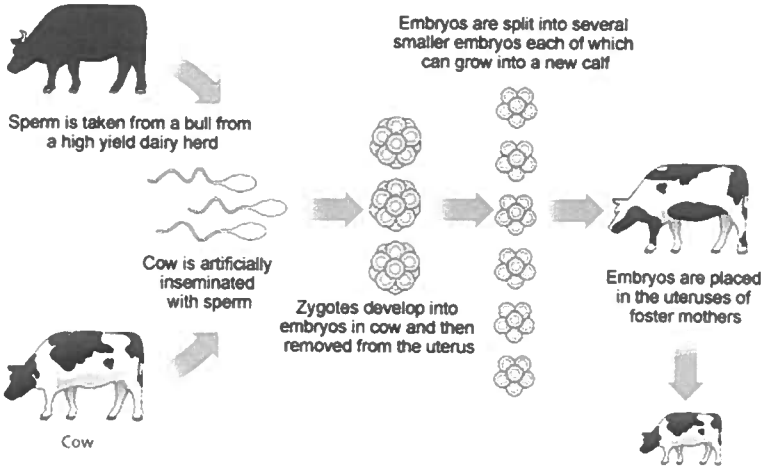
Box 6 - Cloning

A clone is an individual that has been produced asexually or artificially and is genetically identical to the parent. Cloning is usually used if a plant or animal has particularly desirable characteristics.

Plants can be cloned by taking a cutting. This process has been used for many years. A small shoot of the parent plant is cut off, placed in rooting hormone, then put in soil, resulting in the development of an identical plant.



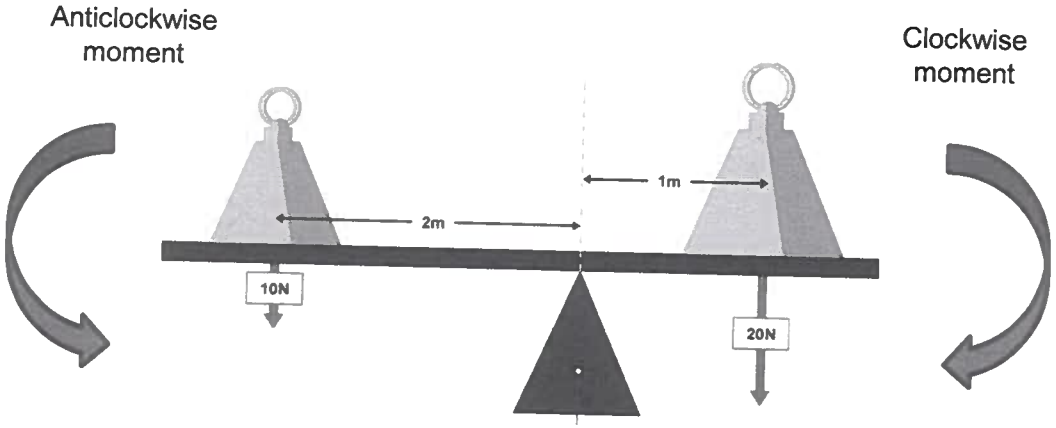
Animals can be cloned using embryo cloning. Fertilisation takes place between the egg and sperm from the parents with desirable characteristics. The resulting cluster of cells, which haven't yet specialised, are split apart and transplanted into surrogate mothers, where they will each grow into a clone of the original cow and bull.
Some people have ethical issues with cloning.



Year 9 Physics Knowledge Organiser Forces 3 page 1

Box 1 - Moment

- **A moment** is a turning force
- Forces can make an object turn if there is a **pivot**
- To calculate the size of a moment you need to know 2 things. The size of the force and the distance from the pivot.
- Take the example of the see saw below:



The turning force on the left of the pivot (the anticlockwise moment) is **10 x 2 = 20 Nm**

The turning force on the right of the pivot (the clockwise moment) is **20 x 1 = 20 Nm**

The units for turning force are Newton metres (Nm).

- We can say that the see saw above is in **equilibrium** this is because the moments that are trying to rotate the see saw anti clockwise are the same as the moments trying to turn the see saw clockwise.
- In other words **the clockwise moments = the anticlockwise moments**
- The seesaw above is therefore **not rotating.**

Key terms	Definitions
Pivot	A point around which something can rotate
Moment	A turning force
Equilibrium	When an object is not rotating due to balanced forces
Newtonmetre	The unit for turning force.

Equation to calculate the moment of a force

$$moment = force \times perpendicular\ distance\ from\ pivot$$

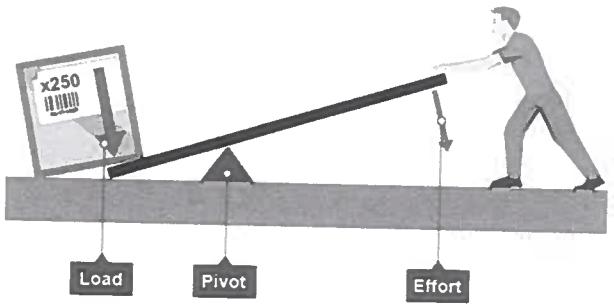
Forces are measured in newtons (N)

Distances are usually measured in metres (m)

Moments are measured in a compound measure using the units for force and distance, newtonmetres (Nm).

Box 2 - Levers

- Levers involve turning, or rotation. Levers allow forces applied to be **multiplied** (made larger). This can make it easier for us to move heavy objects
- Levers have a **pivot**: a fixed centre of rotation
- The moment of a force can be **increased** by:
  1. Increasing the size of the force
  2. Increasing the perpendicular distance from the pivot



Year 9 Physics Knowledge Organiser Forces 3 page 2

Box 3 - Work done by a force

- Applying a force to get an object to move is one way to transfer energy between stores. Transferring energy is also known as '**doing work**'.
- To calculate work done:

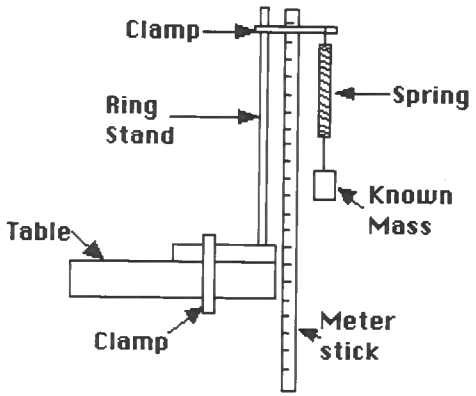
$$work\ done = force \times distance\ moved\ in\ the\ direction\ of\ the\ force$$

- Work is done (energy is transferred) when elastic objects are extended/compressed.
- The amount of work done = the amount of elastic potential energy stored in the elastic object.

Box 4 - Hooke's Law

- Hooke's law applies to all elastic materials/objects. An elastic object is one which will return to its original shape when compressed or stretched
- Hooke's law says: **the extension/compression of an elastic object is directly proportional to the force applied**.
- When an elastic object is extended/compressed, it stores **elastic potential energy**.
- If too much force is applied to the elastic object, it reaches its **elastic limit**. After this elastic limit, the object no longer returns to its original shape once the force is removed.
- To investigate Hooke's law you can use a spring, ruler and mass hanger to apply the force. In this experiment the independent variable would be the force and the dependent variable would be the extension of the spring.

Apparatus for Hooke's Law Lab



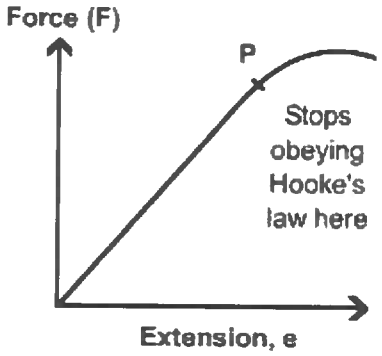
A spring that has been **deformed** and will not return to its **original shape**

Key terms	Definitions
deformation	Changing the shape of a material/object by applying forces.
extension	The measure of how much an elastic object has been stretched.
elastic	Describes materials that can be extended or compressed by forces, and return to their original shape when the forces are removed.
inelastic	Describes materials that don't go back to their original shape after they've been deformed.
direct proportion	Describes a mathematical relationship between variables where: when the independent variable doubles, the dependent variable doubles too.
elastic potential energy	The store of energy in extended/compressed elastic objects.

Equation	Meanings of terms in equation
$Force = spring\ constant\ x\ extension$	*F = force (N)* *k = spring constant (N/m)* *e = extension (m)*

Box 5 - Results from Hooke's Law Experiment

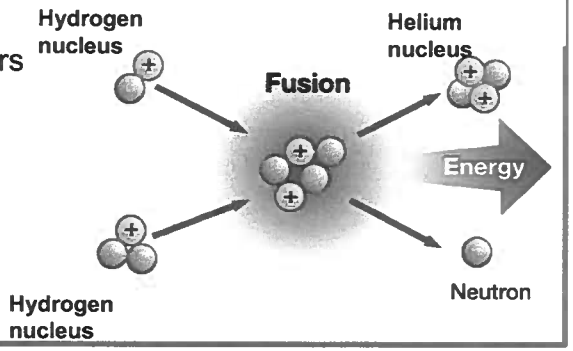
- Force and extension have a **directly proportional relationship.** This means if you double the force the extension of the spring also doubles.
- Hooke's Law is no longer obeyed beyond the elastic limit (marked P on the graph)



Year 9 Physics Knowledge Organiser – Cosmology page 1

Box 1 - Nuclear fusion

Nuclear fusion is a process that occurs in stars and results in a huge release of energy. This is why stars shine.
During nuclear fusion, two nuclei fuse (join together) to make a bigger nucleus and energy.
In stars, the two nuclei are usually hydrogen: when they join together they make a single helium nucleus and release a lot of energy.



Box 2 - Life cycle of a star

Stars are huge balls of gas in space. They are so large and last so long they can seem to last forever. This is not the case: stars go through a life-cycle with identifiable stages. Stars can be divided into two categories based on their size: small stars, of a similar size to our Sun, and massive stars, which are much larger than our Sun. The size of a star affects its life-cycle.

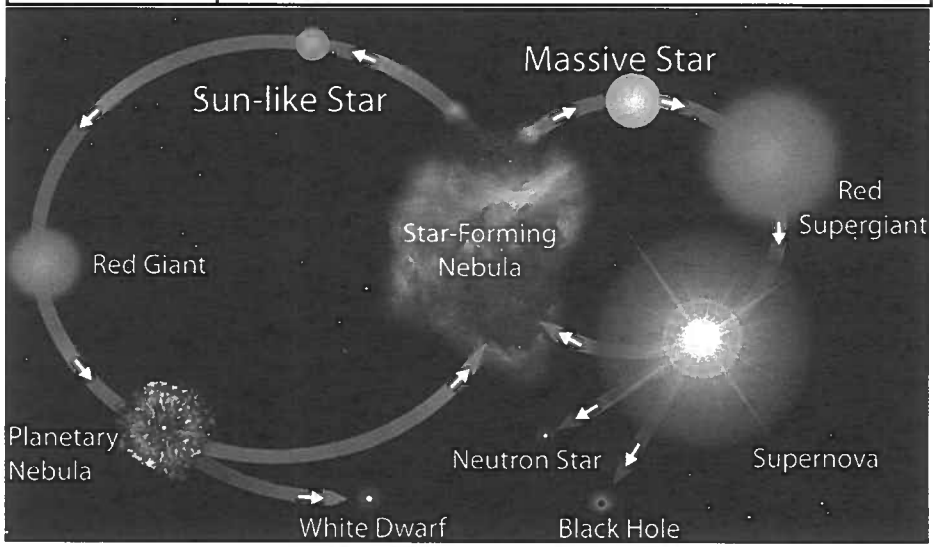
A star the size of our Sun has a life-cycle over five stages: nebula, main sequence, red giant, white dwarf

1. The life-cycle of a star starts when the force of gravity draws particles of gas (hydrogen and helium) in a **nebula** together.
2. The **main sequence** of a star is the main stage of its life-cycle; during this time the star appears white. This is because of the nuclear fusion process, which releases a lot of light and heat. During the main sequence the nuclear fusion uses hydrogen atoms.
3. When most of the hydrogen has fused to form helium the star cools and expands, forming a **red giant**. Massive stars form **red supergiants**.

The end of a star's life-cycle depends on if it is small (Sun-like) or massive

- If the star is small, the outer layers of the red giant star are lost. The outer layers form a **planetary nebula** and what remains is a small, very hot, **white dwarf**.
- If the star is massive, the red supergiant will explode in a **supernova**. What remains normally forms a **neutron star**. The most massive stars form **black holes** after a supernova.

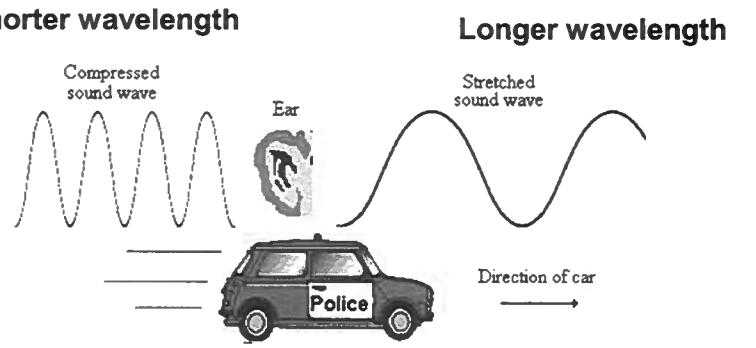
Key term	Definition
Nebula	A giant cloud of dust and gas (hydrogen and helium) in space
Sun-like star	A star with a similar mass to the sun Over the life of the star nuclear fusion occurs: two hydrogen atoms come together making one helium atom, releasing a lot of energy (light and heat)
Red giant	The part of a star's life-cycle when the hydrogen has run out – the star now appears red Red giant stars mainly fuse helium
Planetary nebula	A ring-shaped nebula round an ageing star
Massive star	A star with a mass much larger than the sun's mass
Supernova	The explosion of a massive star when it is a red supergiant
Neutron star	A small, very dense star consisting mainly of closely packed neutrons
Black-hole	Formed after very massive stars collapse Black holes can continue to grow by absorbing the mass of other stars



Year 9 Physics Knowledge Organiser – Cosmology page 2

Box 3 - Doppler effect

The wavelength of a wave (the distance between two points) from a moving object is *shifted*. This is known as the Doppler effect.
If the object is moving away, the wavelength is shifted to be longer.
If the object is moving towards you, the wavelength is shifted to be shorter.
This effect can be heard when a police car, with a siren passes you.



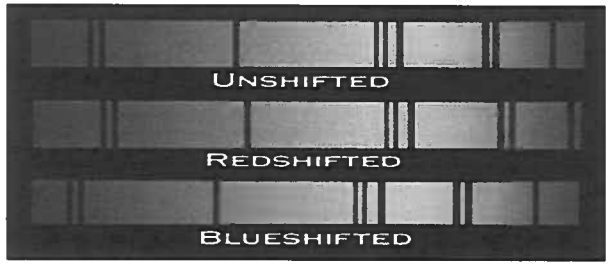
When a car with sirens travels towards you the sound is high-pitched (high frequency wave, the wavelength is shorter); as the sirens move away from you the sound becomes low-pitched (low frequency wave, the wavelength is longer).

Box 4 - Red-shift and blue-shift

Red-shift and blue-shift are examples of Doppler effect for **light.**
Red light has the longest wavelength of visible light and blue light has the shortest.
- When an object is moving towards you the wavelength of the light is shifted to be shorter (Blue-shift).
- When an object is moving away from you the wavelength of the light is shifted to be longer (Red-shift).

→ Objects have to move extremely fast for the difference to be observable; this effect can be observed with distant stars and galaxies.

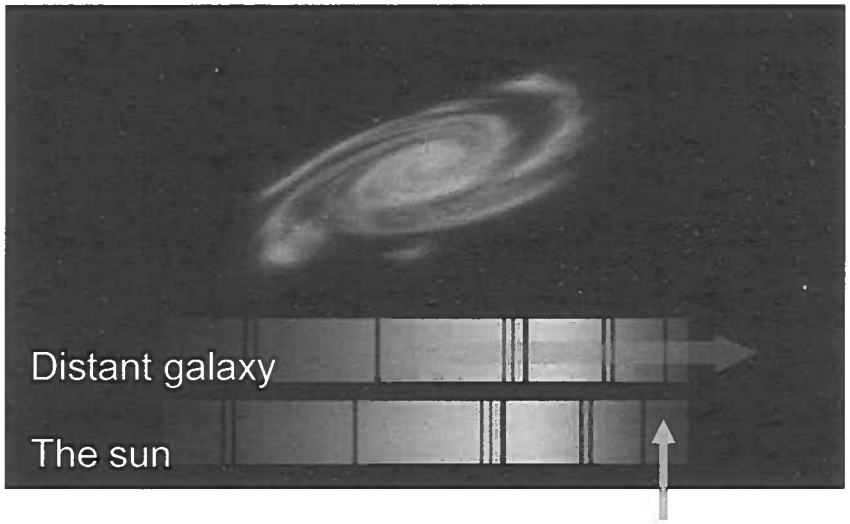
Blue



Red

Box 5 - Cosmological Red-shift

When other galaxies in the universe are observed, they are **all** red-shifted. This means they are all moving away from our galaxy.
This can be seen by comparing absorption spectra from our local star (the sun) with a distance galaxy.
The patterns in the absorption spectra show red-shift.



Light has shifted to the red end of the spectrum

This is strong evidence for the universe expanding as all galaxies are red-shifted and therefore moving away from each other.

Box 6 - The Big Bang

Red-shift and Cosmic Microwave background Radiation (CMBR) are evidence for a theory called the Big Bang.

The Big Bang theory proposes that the universe was created 13.7 billion years ago at a single point. The universe expanded from this point and continues to expand.

There was an alternative theory before the Big Bang theory called Steady State theory. In this theory, there was not a single creation event and the Universe is continually expanding - matter is continually created alongside the expansion.

Red-shift supports both theories, CMBR supports only the Big Bang theory.

Year 9 Chemistry Knowledge Quantitative Chemistry page 1

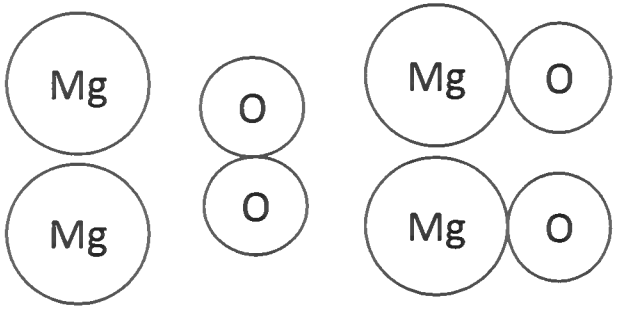
Box 1 - Conservation of mass

Atoms are the basic units of matter that take part in chemical reactions. Atoms cannot be created or destroyed – during chemical reactions the atoms that make up the reactants rearrange to make the products.

→ This means the mass of the reactants always equals the mass of the products.

For example:

	Reactant(s)			**Product(s)**
	Magnesium	+ Oxygen	→	Magnesium Oxide
	2Mg	+ O_2	→	2MgO
Masses used:	4g	2.5g		6.5g



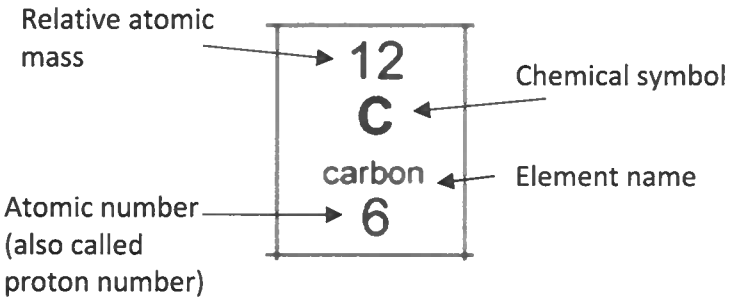
Box 2 - Representing Elements and Compounds using Symbols

- All the elements are given a chemical symbol. Symbols are unique to each element and consist of a single capital letter, often with a second lower case letter. For example, carbon and cobalt both begin with "c", so are distinguished by giving carbon the symbol "C" and cobalt the symbol "Co" (not CO or co).
- All the chemical symbols for all the elements that exist are found in the Periodic Table of Elements, which exists in its current form based on the work of Dmitri Mendeleev.
- The variety of substances that exist are not accounted for by the elements. New substances called compounds are made when elements react together. The chemical formulae of compounds are based on the type of elements and the number of atoms for each element they contain.
- For example: carbon dioxide is made of one carbon atom (C) and two oxygen atoms (O). The chemical formula is CO_2 – the subscript (small) 2 means there are two oxygen atoms.

Key Terms	Definitions
Conservation	When things are kept the same, or maintained.
Mass	The physical substance of an object.
Element	Substances made of one type of atom. All the substances in the periodic table are different types of element.
Compound	A substance made of two or more different elements chemically bonded together in fixed proportions.
Chemical formula	A combination of element symbols and numbers used to describe the variety of atoms in a compound. For example, carbon dioxide is CO_2

Box 3 - Relative Atomic Mass, Ar

- This is the combined mass of the protons and neutrons in the nucleus. All elements have a unique combination of protons and neutrons, and this means they have a unique mass.
- The mass of each element is known as its relative atomic mass because the numbers used are a comparison to the masses of the other elements.



- For example: the Ar of oxygen is 16, the Ar of silicon is 28, and the Ar of chlorine is 35.5.

Year 9 Chemistry Knowledge Quantitative Chemistry page 2

Box 4 - Balancing chemical equations

The conservation of mass in chemical reactions leads to the need to balance chemical equations. The mass of the products needs to equal the mass of the reactants.

Step 1 – write out the chemical formula in its unbalanced form.

$Mg + O_2 \rightarrow MgO$

Step 2 – write out the symbols for the different elements present in the reaction.

$Mg + O_2 \rightarrow MgO$

Mg

O

Step 3 – count how many atoms of each element are present:

$Mg + O_2 \rightarrow MgO$

1 Mg 1

2 O 1

This equation is unbalanced as the number of oxygen atoms is fewer in the products.

Step 4 – add large numbers in front of the chemicals in the reaction, this means you have added in another atom or molecule of that substance, then adjust the totals:

$Mg + O_2 \rightarrow \mathbf{2}MgO$

1 Mg ~~1~~ 2

2 O ~~1~~ 2

Step 5 – keep on adjusting the number of chemicals until the number of atoms of each element is the same:

$\mathbf{2}Mg + O_2 \rightarrow \mathbf{2}MgO$

2 ~~1~~ Mg ~~1~~ 2

2 O ~~1~~ 2

Examples:

$\mathbf{4}Na + O_2 \rightarrow \mathbf{2}Na_2O$

4 ~~1~~ Na ~~2~~ 4

2 O ~~1~~ 2

$\mathbf{2}HCl + Mg(OH)_2 \rightarrow MgCl_2 + \mathbf{2}H_2O$

4 ~~3~~ H ~~2~~ 4

2 ~~1~~ Cl 2

1 Mg 1

2 O ~~1~~ 2

Box 5 - Relative Formula Mass, Mr

- The mass of each molecule is known as its relative formula mass and is calculated by adding together the relative atomic mass of all the atoms present.
- All molecules and compounds have a unique combination of atoms, and this means they have a unique mass.
- For example $CaCO_3$ contains the following elements:
  1 calcium atom – Ar 40 for each atom, so 40 x 1 = 40
  1 carbon atom – Ar 12 for each atom, so 12 x 1 = 12
  3 oxygen atoms – Ar 16 for each atom, so 16 x 3 = 48
  40 + 12 + 48 = 100

Box 6 - Moles

- Moles are quantities given to substances that relate to how many atoms or molecules are present in a sample.
- One mole is equal to 6.022×10^{23} particles of a substance. This number is known as Avogadro's constant.
- Scientists can perform calculations to work out how many moles are present, or how much mass is needed or made in a reaction, linked together by the relative molecular mass.
- The formula used is:

$$moles = \frac{mass\ (g)}{relative\ molecular\ mass\ (Mr)}$$

For example:

A sample of sodium chloride (NaCl) has a mass of 4.75g.

First, calculate the Mr of NaCl

Na: 23 x 1 = 23

Cl: 35.5 x 1 = 35.5

23 + 35.5 = 58.5

$$moles = \frac{4.75g}{58.5}$$

$$moles = 0.0812$$

Y9 Chemistry Knowledge Organiser - Chemical Analysis

Box 1 - Pure and Impure Substances

- In everyday life, a pure substance is something that has nothing added to it, so it is unadulterated – e.g. pure milk, pure honey. In terms of chemistry, these are mixtures.
- In chemistry, pure substance contains only <u>one</u> type of element or compound.
- An impure substance is a mixture.

Box 2 - Melting Point and Boiling point

- A chemically pure substance will melt or boil at a very specific temperature.
- Impurities decrease the melting point and increase the range of temperatures over which a substance will melt.
- Impurities increase the boiling point of a substance and increase the range of temperatures over which a substance will boil.

Box 3 - Formulations

- Formulations are mixtures that are designed as useful products. They are often complex mixtures with lots of different components (parts).
- Formulations are made by mixing the components in carefully measured quantities so the product has the correct properties.
- Examples of formulations include paint, fuels, cleaning agents, medicines, alloys, fertilisers, food.

Box 4 - Gas Tests

:

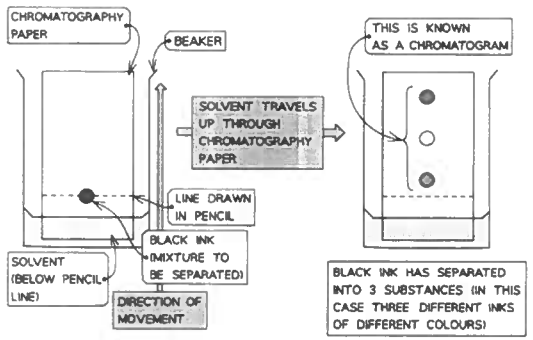
Hydrogen - Place a lit splint into the gas and there is a squeaky pop.

Oxygen – Place a glowing splint in to the gas and the splint relights.

Chlorine – Place damp litmus paper into the gas and the litmus paper bleaches.

Carbon dioxide – Bubble the gas through limewater and the limewater turns cloudy.

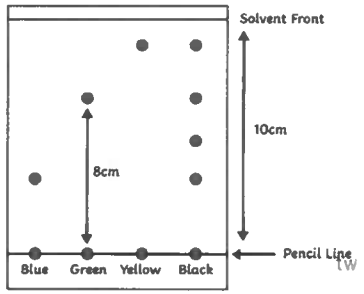
Box 5 – RP: Chromatography



Key Terms	Definitions
Pure substance (chemistry)	A substance made of a single element or compound and not mixed with any other substance.
Melting point	The temperature at which a substance melts or freezes/solidifies.
Boiling point	The temperature at which a substance boils or condenses
Formulations	Complex mixtures that are designed as useful products.
Chromatography	A technique where mixtures can be separated based on their solubility.
Stationary phase	The phase that doesn't move (i.e. the filter paper)
Mobile phase	The solvent (normally water) which moves up through the stationary phase.
Rf value	The ratio between the distance travelled by the substance and the distance travelled by the solvent.

Box 6 - Chromatography and Rf values

- Chromatography can be used to separate mixtures and can be used to identify substances.
- Chromatography involve two phases:
  - stationary phase where particles can't move (the filter paper in most cases).
  - mobile phase - the solvent (for example water) which moves up the paper.
- Separation depends on the distribution of substances between the stationary phase and the mobile phase.
- The ratio of the distance moved by the spot and the distance moved by the solvent is called the Rf value. It is always a value <1
- $Rf = \frac{Distance\ travelled\ by\ the\ substance}{Distance\ travelled\ bu\ the\ solvent}$
- Different compounds will have different R_f values in different solvents.
- A pure substance will produce a single spot in all solvents.



Rf green = 8 ÷ 10 = 0.8

Y9 Chemistry Knowledge Organiser
Chemistry of the Atmosphere

Box 1 - The Atmosphere

For 200 million years, the amount of different gases in the atmosphere have been much the same as they are today:

- 78% nitrogen
- 21% oxygen
- The atmosphere also contains small proportions of various other gases, including carbon dioxide, water vapour and noble gases.

Box 2 - The Evolution of the Atmosphere

Scientists are not sure about the gases in the early atmosphere, as it was so long ago (4.6 billion years) and due to the lack of evidence.
Many scientists believe the early atmosphere was made up of mainly carbon dioxide, water vapour and small amounts of methane, ammonia and nitrogen, released by **volcanoes. There was little or no oxygen around at this time.**

Oceans - The early Earth was very hot, but as it cooled the water vapour in the atmosphere condensed and **formed the oceans.**

Decreasing carbon dioxide - As the oceans formed, carbon dioxide dissolved in the ocean. The carbon dioxide formed carbonates which precipitated out (formed solids). This process reduced the amount of carbon dioxide in the atmosphere.

Decreasing carbon dioxide and increasing oxygen - Approximately 2.7 billion years ago algae evolved and soon after this oxygen appeared in the atmosphere. Over the next billion years plants evolved. This decreased the amount of carbon dioxide in the atmosphere and increased the amount of oxygen in the atmosphere as they carried out photosynthesis

When sea animals evolved they used the carbon dioxide in the ocean to form their shells and bones (which are made of carbonates). When these sea creatures died their shells and bones became limestone (calcium carbonate), which is a sedimentary rock.

Once enough oxygen was in the atmosphere, it allowed animals to evolve.

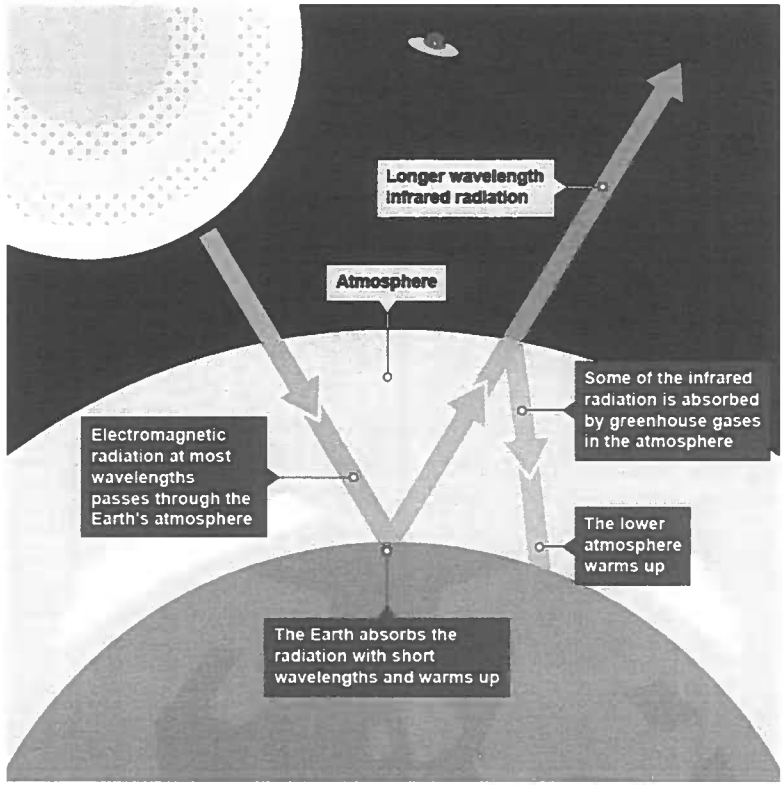
Box 3 - The Greenhouse Effect

The Earth's atmosphere contains greenhouse gases. These gases, which include carbon dioxide, methane and water vapour, maintain the temperature on Earth high enough to support life.

The greenhouse gases allow the short wave infrared radiation emitted by the Sun to pass through it but absorbs the long wave infra red radiation which is emitted by the Earth. This is how it insulates the Earth.

Some human activities increase the amounts of greenhouse gases in the atmosphere. These include:

- combustion (burning) of fossil fuels
- deforestation
- methane release from farming and destruction of peat bogs.
- more animal farming (digestion, waste decomposition)

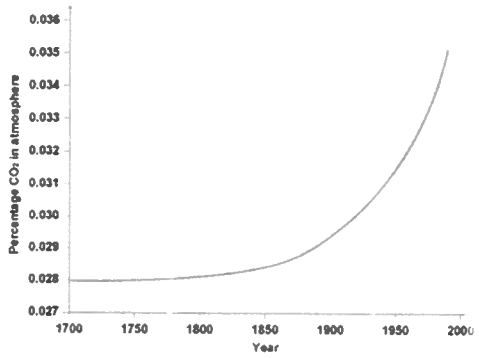


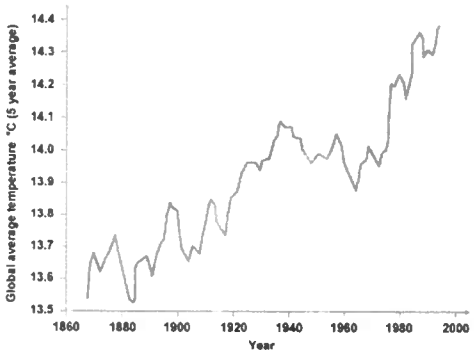
Y9 Chemistry Knowledge Organiser
Chemistry of the Atmosphere

Key Terms	Definitions
Peer reviewed evidence	This is evidence that has been scrutinised by other independent scientists to check for bias, inaccuracy and any flaws in the design of the investigations or data gathering.

Box 4 - The Enhanced Greenhouse Effect

Humans activities have enhanced the greenhouse effect through combustion of fossil fuels, increased farming and deforestation and destruction of peat bogs.
There is correlation between the increased levels of greenhouse gases in the atmosphere and the global average temperature. Based on peer reviewed evidence, many scientists believe this has lead to a **rise in global temperature.**





However, this is such a complex system and it is very difficult to model. When simplified models are presented, it can lead to **inaccurate or biased** opinions being reported in the media.

Box 5 - Consequences of Climate Change

An increase in average global temperature is a major cause of **climate change.**
The potential effects of global climate change include:
- melting of polar ice caps and sea level rise, which may cause flooding and increased coastal erosion
- more frequent and severe storms
- changes in the amount, timing and distribution of rainfall
- water shortages for humans and wildlife
- changes in the food producing capacity of some regions
- changes to the distribution and migration patterns of wildlife species.

Box 7 - Carbon Footprint

The **carbon footprint** is the total amount of carbon dioxide and other greenhouse gases released over the life of a product. Many people or businesses look to reduce their carbon footprint by:
- increased use of alternative energy supplies
- energy conservation
- carbon capture and storage
- carbon taxes and licences

People also try to **offset** their carbon by planting trees.
If something is carbon neutral, this means that there is no net increase in **carbon dioxide in the atmosphere** when it is used.

Box 8 - Other atmospheric pollutants

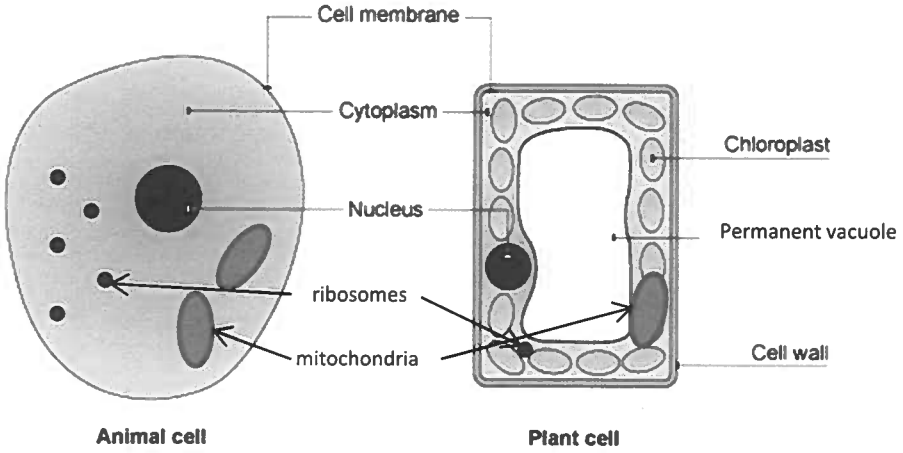
The combustion of fuels is a major source of atmospheric pollutants. When burning fuels, other pollutants are made. The effects of these pollutants are summarised below.

Gas	How are they made?	What is the affect?
Sulphur dioxide	Fuels contain a small amount of sulphur. This reacts with oxygen to form sulphur dioxide	Respiratory problems and acid rain
Nitrous oxides	Oxygen reacts with nitrogen in the air	Respiratory problems and acid rain
Carbon particulates	Is made during incomplete combustion	Can cause global dimming and health problems
Carbon monoxide	Is made in incomplete combustion of a fuel	Is a toxic gas. It is also colourless and odourless

Yr9 Biology Knowledge Organiser
Cell Biology

Box 1 - Eukaryotic Cells

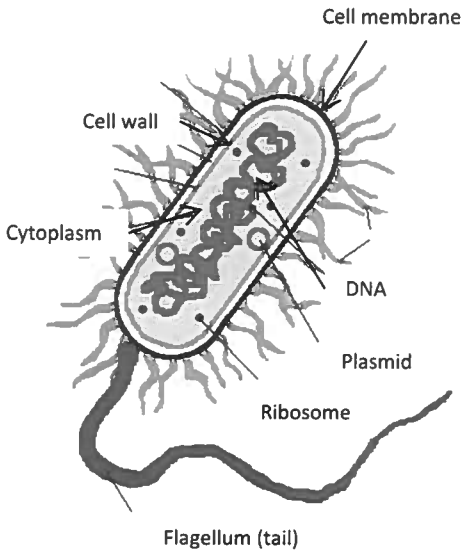
Eukaryotic cells include all plant, animal and fungus cells.
They are eukaryotic cells because they **have a nucleus**, unlike prokaryotic cells. Learn how to identify the general cell structures (sub cellular structures) shown below.



Box 2 - Prokaryotic Cells

Bacteria are prokaryotic cells (all bacteria are single-celled organisms). The most important differences to eukaryotic cells are that they are smaller and the do not have a nucleus. (**genetic material (DNA) is not enclosed in a nucleus.**)

Prokaryotic cells have DNA in a loop, and, in addition to the main loop of DNA, they have small loops of DNA called plasmids.

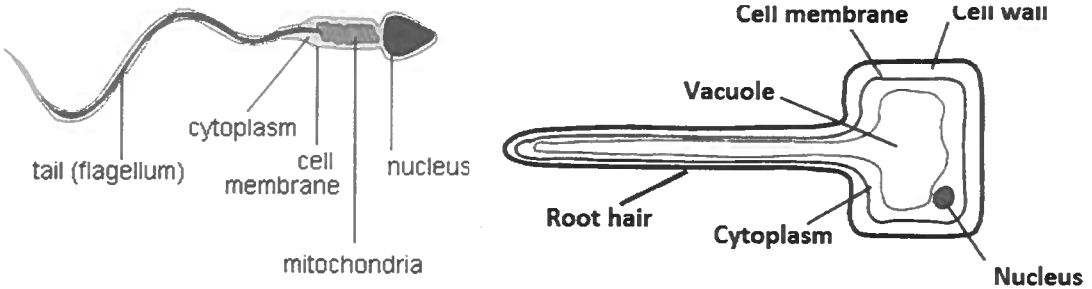


Key Terms	Definitions
cell	The basic unit of <u>all</u> forms of life. (All living organisms are made of a least one cell.)
eukaryotic cells	Cells with a nucleus – e.g. plant, animal and fungal cells.
prokaryotic cells	Cells that don't have a nucleus.
sub-cellular structure	A part of a cell. (Sub- means less than – so these are the component parts of cells.)
cell membrane	Controls the movement of substances into and out of the cell and is partially permeable (lets some things through but not others).
nucleus	The enclosure for genetic material found in plant and animal cells (eukaryotic cells).- controls all cell activites
cytoplasm	Where most of the chemical reactions in the cell take place.
mitochondria	Where aerobic respiration takes place.
ribosome	Site of protein synthesis (i.e. where proteins are made)
chloroplast	The site of photosynthesis – only found in plant cells and algal cells.
permanent vacuole	It is filled with cell sap (a store of nutrients for the cell). A sub-cellular structure only found in plant and algal cells –
cell wall	It is made of cellulose, it is outside the cell membrane and it strengthens the cell. Found in plant, fungal and bacterial cells
DNA	The molecule that holds the genetic information in a cell. In eukaryotic cells, it is in linear strands . In prokaryotic cells, the DNA forms a loop.
plasmid	A small loop of DNA, only found in prokaryotic cells.

Yr9 Biology Knowledge Organiser
Cell Biology

Box 3 - Multicellular Organisms

Multicellular organism are organisms made up from lots of cells. just like all animals, plants and many types of fungus. But, not all cells are the same. Cells become specialised by **differentiation**, which means they develop new features to help them perform a specific function. E.g. sperm cells and root hair cells.



Tissues - Cells with similar structures and functions working together. For example: muscle tissue in animals; phloem tissue in plants.

Organs - Multiple tissues working together to perform a function. For example: the stomach in animals; the leaf in plants.

Organ systems are formed when multiple organs work together. For example: the digestive system in animals; the vascular (transport) system in plants.

Box 4 - Microscopy

Use of a microscope is called microscopy. Microscopes allowed scientists to discover cells and find all the sub-cellular structures.
Because cells and their parts are very small, it is not useful to measure them in metres. Instead, we use small divisions of the metre as follows:

Centimetre = 1/100 metre (10^{-2} m). A centimetre is 1 one hundredth of a metre. (cm)
Millimetre = 1/1000 metre (10^{-3} m). A millimetre is 1 one thousandth of a metre. (mm)
Micrometre = 1/1 000 000 (10^{-6} m). A micrometre is 1 one millionth of a metre. (µm)
Nanometre = 1/1 000 000 000 (10^{-9} m) A nanometre is 1 one billionth of a metre. (nm)

Electron microscopes have higher magnification and higher resolution (more resolving power) than light microscopes, so they let you see smaller structures and see structures in more detail.

Key Terms	Definitions
organism	Any 'whole' living thing: can be made of one cell or be multicellular. An organism has many organ systems, all contributing to its survival.
multicellular	This describes an organism that is made of lots of cells – such as animals or plants.
specialised cell	A cell with a particular function and a shape and structure to suit its function. e.g. a sperm cell is specialised
tissue	A group of cells with similar structures and functions – i.e. a group of specialised cells.
organ	An organ is a collection (or aggregation) of different tissues working together to perform a particular function (job)
organ system	Organs don't operate alone: they work together to form organ systems.
light microscope	A usual school microscope is a light microscope. You can see large sub-cellular structures like a nucleus with it, but not a lot more detail than that.
magnification	This is the measure of how much a microscope can enlarge the object you are viewing through it.
resolution	This is the measure of the level of detail you can see with a microscope, the clarity between 2 points on an image.
electron microscope	A type of microscope with much higher magnification and resolution than a light microscope. Essential for discovering the smaller sub-cellular structures.

Equation	Meanings of terms in equation
$magnification = \frac{size\ of\ image}{size\ of\ real\ object}$	*The image Is how it looks through the microscope. The real object is what you are looking at. The image and object must be measured with the same unit, e.g. both in nm.*

Yr9 Biology Knowledge Organiser
Cell Biology

Box 5 - Stem cells

Stem cells that are **undifferentiated cells** that are able to **divide or differentiate** into specialised cells. Once cells are specialised, they can't go back to being an unspecialised cell. There are two different types of stem cells.

Embryonic stem cells – These are cells found in early embryos and these stem cells can differentiate into any kind of cell.

Adult stem cells – these are cells found in places such as bone marrow or skin. These cells can differentiate into a limited number of different types of cells. (for example bone marrow stem cells can differentiate to become all the different types of cells found in the blood).

Stem cells from bone marrow and embryos can be grown in a lab to produce clones (genetically identical cells) and then made to differentiate so they can be used in medicine or research

Using stem cells in this way is an active area of medical research, to treat conditions like diabetes and paralysis.

Therapeutic cloning is where stem cells are produced that have the same genetic information as the patient and therefore when they are used as a treatment the patient's body won't reject them.

Some people have ethical objections to stem cell research. For example they believe that every embryo is a potential life and that these cells shouldn't be used for experiments.

Plant stem cells are found in the meristems. These are parts where plant growth occurs (e.g. the tips of the shoot and roots). They can continue to differentiate into any kind of cell throughout their life into any kind of plant cell.

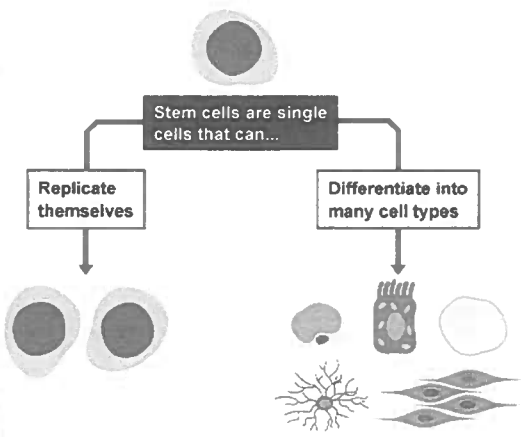
Box 6 - The cell cycle

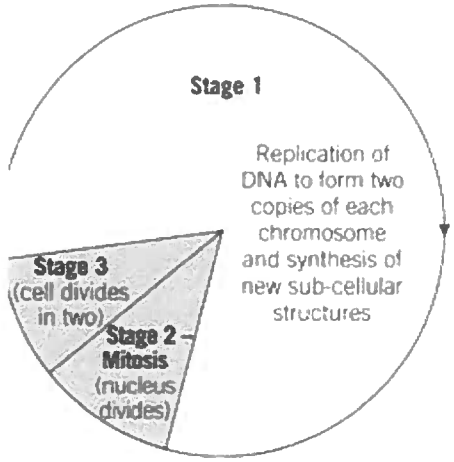
Cells divide into two to make new cells, for growth and repair, in the **cell cycle**. It isn't as simple as the cell splitting in two: it must prepare before doing that.

Stage 1 - The **cell grows** larger and **makes more sub-cellular structures**, such as ribosomes and mitochondria.. Also the genetic material (**DNA**) is replicated (copied) by making an exact replica of the chromosomes. So, there are two copies of every chromosome at this point in the cell cycle.

Stage 2 - **Mitosis** occurs: tiny fibres in the cell pull the copies of each chromosome to opposite ends of the cell, breaking the replica chromosomes apart. This means there is a full set of chromosomes at each end of the cell.

Stage 3 - The cytoplasm and cell membranes divide to form two genetically identical cells.



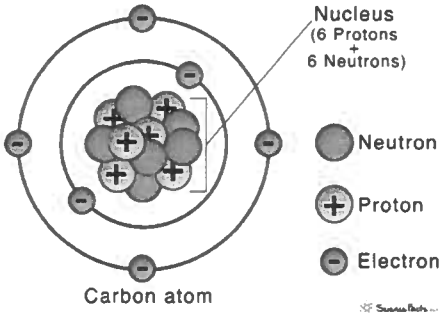


Key Terms	Definitions
differentiation	The process of becoming a specialised cell (e.g. a sperm cell or a red blood cell or a root hair cell)
stem cells	Cells that are undifferentiated. Stem cells are capable of dividing and differentiating to form specialised cells.
embryo	A very young multicellular organism, formed by fertilisation. Embryos are made of stem cells.
cell cycle	The series of stages during which cells grow and divide to make new cells.
mitosis	A type of cell division used for growth, repair and asexual reproduction. A part of the cell cycle.
chromosome	A structure made from one molecule of DNA. One chromosome contains many genes. In body cells, chromosomes are found in **pairs.**

Yr9 Chemistry Knowledge Organiser
Topic: Atomic Structure and the Periodic Table 1

Box 1 - The Structure of the Atom

- All substances are made from atoms. Atoms are very small. The radius of atom is about 0.1 nanometres ($1x10^{-10}$ m).
- The central part of the atom is known as the nucleus. The radius of the nucleus is less than 1/10,000th the radius of an atom (about $1x10^{-14}$m).
- An atom is made up of three **sub-atomic** particles: **protons**, **neutrons** and **electrons**.
- Protons and neutrons are found in the **nucleus.**
- Electrons are found orbiting the nucleus in **shells** (also known as *energy levels*).



The mass and charges of the sub-atomic particles :

	Mass	Charge
Proton	1	+1
Neutron	1	0
Electron	0	-1

- Atoms have **no overall charge** because they have the same number of positive protons as negative electrons.

Key Terms	Definitions
atom	All substances are made of atoms. They are the smallest part of an element that can exist.
element	Elements are substances made of a single type of atom. All atoms of a particular element have the same number of protons. Eg. Helium atoms always have two protons.
nucleus	The nucleus is the centre of an atom; it is made of protons and neutrons.
proton	Protons are sub-atomic particles found in the nucleus, they have an electric charge of +1 and a relative mass of 1.
electron	Electrons are sub-atomic particles found in the electron shells of an atom, they have an electric charge of -1 and a negligible mass.
neutron	Neutrons are sub-atomic particle found in the nucleus of an atom, they have an electric charge of 0 and a mass of 1.
nanometre	A unit of measurement: it is 1 x 10^{-9} metres. The symbol for nanometres is nm.
sub-atomic	Sub-atomic particles are particles smaller than an atom (protons, neutrons, electrons).
isotope	Isotopes are atoms of an element that have a different number of neutrons.

Box 2 - Atomic Number and Mass Number

Mass number
The total number of protons and neutrons in an atom

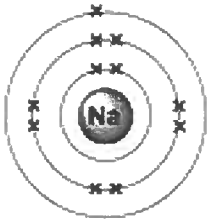
Atomic number
The number of protons in the nucleus

$^{23}_{11}Na$

Therefore sodium has 11 protons, 11 electrons and 23 – 11 = 12 neutrons
Atoms of the same element can have different numbers of neutrons. These atoms are called **isotopes**.

Box 3 - Electron Configuration/Electronic Structure

The electron configuration of an element describes how electrons are positioned in the electron shells of an atom.
The inner shell is always filled first until it is full. Each shell is filled in turn until it has the maximum number of electrons it can take.
Shell 1: maximum 2 electrons
Shell 2: maximum 8 electrons
Shell 3: maximum 8 electrons

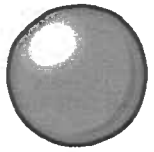
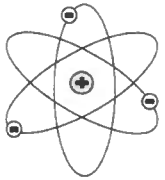
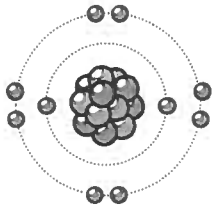


The electronic configuration of Sodium (Na) can also be written like this: 2,8,1. This shows there is 2 electrons in the 1st shell, 8 electrons in the second shell and 1 electron in the 3rd shell.

Yr9 Chemistry Knowledge Organiser Topic: Atomic Structure and the Periodic Table 1

Box 4 - The development of the atomic model

Our understanding of the structure of the atom has changed over time due to experimental evidence, deduction and technological developments. As new evidence is discovered the atomic model may change.

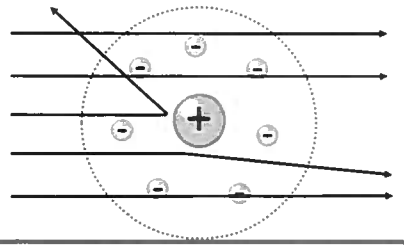
Who and when	Description of atomic model	Diagram of atomic model
John Dalton, 1803	All matter is made up of indivisible spheres called atoms. Substances made of one type of atom are elements and substance made of different types of atom chemically bonded together are compounds	
JJ Thomson, 1897	Discovery of the **electron** **Plum pudding model – positive sphere with electrons dotted through**	
Ernest Rutherford, 1909	Discovery of the nucleus **Nuclear model** - the **mass of the atom** is concentrated at the centre of the atom in the **nucleus**, which has a positive charge. Found through the **alpha particle scatter experiment.**	
Niels Bohr, 1916	Discovery that electrons orbit the nucleus in **energy levels/shells**.	
Ernest Rutherford, 1920	Discovery of the **proton**, the positive particle in the nucleus.	
James Chadwick, 1932	Discovered the **neutron** in the nucleus.	

Box 5 - The alpha particle scattering experiment

Rutherford fired alpha particles at gold leaf (very thin gold). His results showed that the mass of atoms is concentrated at the centre (in the nucleus) and that the nucleus is positively charged.

The observations and conclusions of the experiment

- Most alpha particles pass straight through - atoms are mostly empty space.
- A few deflect, but by more than expected - repelled by nucleus
- Occasionally alpha particles deflected back (completely unexpected) - the nucleus is small and positively charged.



Key Terms	Definitions
mixture	A mixture is made of two or more elements or compounds that are not chemically combined together. The chemical properties of the substances in the mixture are not changed.
compound	Compounds are made of two or more elements that are chemically bonded together in a fixed ratio.
group	Groups are the columns (down) on the periodic table.
period	Periods are the rows (across) on the periodic table.
reactant	Reactants are chemicals you start with in a chemical reaction.
product	Products are the chemicals made in a chemical reaction.

Box 6 - Elements

An **element** is a substance made from only one type of atom. All the elements that exist are shown in the periodic table and are given a symbol. E.g Oxygen – O, Iron - Fe

Box 7 - Isotopes

Isotopes are atoms of the same elements that have the same number of protons but a different number of neutrons.

Number of Neutrons = Atomic Mass – Atomic Number

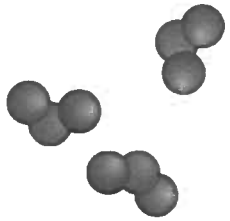
Number of Neutrons = 12 – 6 = 6	Number of Neutrons = 13 – 6 = 7	Number of Neutrons = 14 – 6 = 8
$^{12}_{6}C$	$^{13}_{6}C$	$^{14}_{6}C$
Carbon-12 98.9%	Carbon-13 1.1%	Carbon-14 <0.0001%

Yr9 Chemistry Knowledge Organiser Topic: Atomic Structure and the Periodic Table 1

Box 8 - Compounds

- Compounds are made of two or more elements that are chemically bonded together in a fixed ratio.

e.g. water – H_2O



2 Hydrogen atoms bonding with 1 oxygen atom

Box 9 - Chemical reactions

In a chemical reaction, chemical bonds in the reactants are broken, the atoms are re-arranged and new chemical bonds are made to form the products.

Either word equations or symbol questions can be used:
Word equation carbon + oxygen → carbon dioxide
Symbol equation $C + O_2 \rightarrow CO_2$

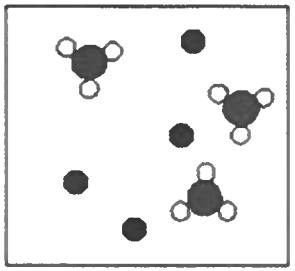
The arrow (→) in chemical reactions means "reacts to make".
In a chemical reaction, **mass is never lost**; the mass of the products always equals the mass of the reactants – this is the **conservation of mass**.

$$2Mg\ (5g) + O_2\ (3g) \rightarrow 2MgO\ (8g)$$

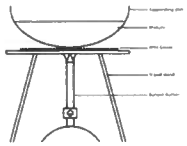
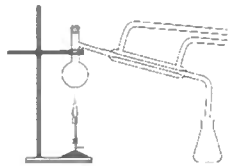
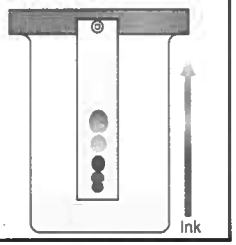
In some chemical reactions it may appear that the mass of the products is less than the mass of reactants. This is not the case and may be because a gas has been made and some has escaped.

Box 10 - Mixtures

A mixture is made of two or more elements or compounds that are not chemically combined together. The chemical properties of the substances in the mixture are not changed.
Mixtures can be separated into the elements and compounds they contain in a variety of ways. Each is a physical process; chemical bonds are not broken, so no new substances are made.
Mixtures can be thought of as **impure** substances; the purpose of separating a mixture may be to recover the elements and compounds in the mixture as **pure** substances.



Box 11 - Separating mixtures

Method	Explanation	Diagram
Filtration	Separating an insoluble solid from a liquid. Eg. A mixture of water and sand can be separated using filter paper.	
Crystallisation	During crystallisation, a solution is heated, and the solvent evaporates leaving the solute. Eg. A solution containing water and salt will leave pure salt crystals when the water is evaporated.	
Distillation	Separate a solvent from a solution or two liquids with different boiling points. Involves evaporation and condensation. Eg. Water can be separated from a salt solution.	
Fractional distillation	Fractional distillation is when two liquids with **different boiling points** are separated because they boil at different temperatures. Eg. ethanol (alcohol) boils at 78 °C and water boils at 100 °C	
Chromatography	Substances travel at different rates through a medium depending on their solubility in the solvent used (often water, but not always). Eg. To separate and identify the dyes in food colouring.	

History: Knowledge Organiser Year 9 Autumn Term 2022

The Boer War	Emily Davison protest		Representation of the People Act	1924 Housing Act	Wall Street Crash	**The Great Depression**	Second World War begins
1899-1902	**1913**	**1914**	**1918**	**1924**	**1929**		**1939**

First World War | **Interwar Years**

Changes in 20th Century Britain

Britain changed in significant ways during the **20th Century**. Historians disagree about what the **big story** of the **20th Century** was:

Big Story 1: Britain's changing relationship with the rest of the world

Big Story 2: The changing role and status of British women

Big Story 3: The Development of the Welfare State

The Boer War

In 1899, Britain went to war with Boer farmers in South Africa over control of diamonds and farm land. Despite the Boers' weaknesses, the British army lost early battles, such as the Battle of Spion Kop. 40% of new recruits had to be turned away because of ill health caused by poor living conditions in the slums of Britain's cities. ***The Liberal Reforms*** (1906-1914) introduced the beginnings of a welfare state, including: free school meals, pensions, and sick pay for workers.

Votes for Women: 19th Century Britain was a highly patriarchal society Women were expected to remain in the domestic sphere In the 19th Century most working men had been given the franchise, but no women. The suffragettes campaigned using militant methods and the suffragists used peaceful ways of campaigning. The actions of the Suffragettes gained huge publicity for the cause of women's suffrage. However, some argued that the Suffragettes' tactics proved that women were not responsible enough to vote When war broke out in 1914, women still did not have the right to vote.

The First World War; In 1914, war broke out between two great alliances: the **Triple Entente** of France, Britain, and Russia and the **Triple Alliance** of Germany, Austria-Hungary, and Italy. British soldiers fought in the trenches of the Western Front as well as in Africa and the Middle East. Trench warfare brought many hardships: trench foot, shell shock, and lice. The war left 700,000 British soldiers dead and 1.7 million wounded Britain fought the war with the support of her colonies: Indian and Australian soldiers played essential roles. 1.3 million Indians served in WWI. British women began working in munitions factories and taking traditionally 'male' jobs such as bus drivers. Women were always paid less than men for doing the same job. The German army surrendered in November 1918. After the war, the British government promised to create a ***'country fit for heroes to live in'*** and began building new council houses. Some colonies, such as Australia were rewarded with increased independence. However, Britain continued to ignore Indian demands for independence. The 1918 ***Representation of the People Act*** gave the vote to women over 30. However, many women were forced to give up their wartime jobs as men returned home.

Apogee of Empire: The British Empire reached its apogee in 1921 as Britain gained colonies such as Tanzania, Iraq, and Palestine from it's defeated enemies. The Suez Canal in Egypt allowed British ships to sail to India and other colonies three times faster than sailing around the southern tip of Africa. The Singapore Naval Base protected colonies such as Australia and India but took 20 years to build and cost £60 million. Britain had to borrow money from the United States of America to pay for the war.

By 1919, Britain owed $7.4 billion to the USA. Rebellions against British rule continued across the Empire. In India, the British made promises of independence in the future but crushed protests violently, as in the ***1919 Amritsar Massacre***.

The Interwar Years: The interwar years is the name that historians give to the period between the end of the First World War (1918) and the start of the Second World War (1939) In these years, British governments aimed to build a 'country fit for heroes to live in'. However, despite some successes, they failed in many areas. **Employment:** The Great Depression of the 1930s led to over 20% unemployment in the UK and thousands turned to soup kitchens to survive. Unemployed people could claim the dole but this depended on a means test in which government officials checked homes to make sure a family was poor enough to receive help. **Housing:** Before World War I, many people in Britain lived in overcrowded and unsanitary slums. ***The 1924 Housing Act*** gave local councils money to build new council houses with clean running water, indoor toilets/gardens. However, economic problems - such as the Great Depression and the debt to America - meant the government could not afford to build enough council houses and slums remained. **Healthcare:** Finding affordable healthcare remained a problem for most people in Britain. The doctor's fee of around 5 shillings, let alone the cost of medicines or a hospital stay, was beyond the reach of the working class. Some help was available through National Insurance which made healthcare affordable for working men but did not cover their wives, children, or the unemployed.

Communist Russia: Communists criticised capitalist society and had a vision of a fairer world. Karl Marx believed that the workers should form a government. In October 1917, the Bolsheviks took control of Russia in the Russian Revolution. The Bolsheviks were a communist political party led by Lenin. ***The Bolsheviks:*** established a communist government in Russia, ended the war in Germany, renamed the country the USSR and murdered the Tsar. The Bolsheviks were able to seize power because: Russia was losing the war against Germany, The Tsar was unpopular, most Russians were poor peasants and industrial workers, The Bolsheviks had an effective Red Army led by Leon Trotsky. Lenin changed Russia completely, but did not always live up to Marx's idea of communism. In 1924, Lenin died. He was succeeded by Joseph Stalin who ruled until his death in 1953. Stalin seized complete power in Russia, becoming a dictator. He removed Trotsky, he purged anyone who challenged his power and he used propaganda to show his greatness. ***The lives of women*** changed under the revolution. 1918, Lenin introduced a decree that gave women equal status to men. It became much easier for women to divorce their husbands. The government encouraged women to access education up to university level. The government ran nurseries so women would have free time to work and study. During WWII, many Russian women fought on the frontline. ***Industrialisation:*** Russia was much less industrialised than other European countries. In 1928, Stalin launched the first Five Year Plan: the first of a series of extremely high targets for producing industrial resources. ***The Five Year plan:*** Russian production of coal, steel, and iron increased. New hospitals/transport systems were built. By the 1940s, USSR was powerful enough to defeat Hitler in WWII. But manufacturing output was still behind the USA. Soviet workers in new cities worked in terrible conditions and were sent to the gulag if they went on strike. Many workers were forced labourers and prisoners. In 1927, Stalin introduced a policy of ***Collectivisation:*** This meant that peasants in each village united their farms into one collective farm - known as a kolkhoz. Land, tools and animals were pooled together so everyone could use them. Motor Tractor Stations were set up to distribute tractors to the kolkhoz. 90% of kolkhoz produce went to the government; the farmers kept 10%. The chaos caused famine in 1932-33, leading to over 5 million deaths.

Weimar Germany: The November revolution occurred because the Kaiser abdicated. A new government was introduced called ***The Weimar Government***. This was a democratic government. Fredrick Ebert, the leader of the SPD became the German President and signed an armistice with the allies. Many people in Germany were angry with this. The new government allowed all men and women aver the age of 21 to vote and used a system of proportional representation so each political party has seats in Reichstag. ***Rebellions:*** 1. Left-wing Germans, such as Rosa Luxemburg, believed the November Revolution had not gone far enough and wanted a communist revolution, as there had been in Russia. 2. In 1920, some right-wing soldiers tried to seize power in the Kapp Putsch, but they failed. ***The Treaty of Versailles:*** The victorious allies forced the Weimar Republic to sign a harsh peace treaty. Germany lost land, soldiers, money and was blamed for WWI. Despite the problems facing Germany, some historians view the 1920s as the ***Weimar Republic's Golden Years*** because they borrowed $3 billion from the USA so the economy was stable. Women had greater rights and freedoms, There were new cultural developments like the Dada art movement and politically not many people voted for extreme parties like the Nazi's. After 1933 the ***Nazi Party*** began to rise to power. The Nazi Party took advantage of the ***Great Depression*** and Hitler was appointed ***Chancellor in 1933***.

Nazi ideology: Anti-Semitism - Jews were made scapegoats for Germany's problems and the Nazis promised to end the Great Depression - They promised to make Germany great again by offering voters work and bread. Hitler was able to remove key obstacles so he could rise to power: The Reichstag was set on fire in February 1933. The Nazis convinced the German public that a communist revolution was beginning. Hindenburg issued the ***Reichstag Fire Decree*** which allowed the Nazis to arrest all the communist leaders. March 1933: ***The Enabling Act*** allowed Hitler to make laws without the Reichstag voting on them. The SA surrounded the Reichstag to intimidate the representatives as they voted for the Act Communist representatives were not able to vote. Anyone who opposed the Nazis were sent to new ***concentration camps*** like the one at Dachau. ***July 1934: The Death of Hindenburg:*** When Hindenburg died, Hitler combined the roles of Chancellor and President to create a new role for himself: ***the Fuhrer***

Vocabulary

20th Century	The period 1900-2000
Agriculture	Farming
Alliance	An agreement to support each other
Anti Semitism	Hatred of the Jews
Apogee	High point
Boers	Dutch farmers in South Africa
Council houses	Homes built by the government
Capitalism	Economic system in which property is owned by individuals for private profit
Communism	Economic system in which all property is owned by the community, rather than by individuals
Collectivisation	Stalin's Agricultural policy
Debt	Money owed to someone else
The Dole	Slang for unemployment benefit
Franchise	The right to vote
Gulag	Soviet prison camp
Kolkhoz	A collective farm in USSR
Munitions	Weapons and ammunition
Patriarchal	Dominated by men
Purge	Get rid of by force
Significant	Leading to change, causing or revealing
Suffrage	The right to vote
Suffragettes	Suffrage groups using extreme methods
Suffragists	Suffrage groups using legal methods
Slums	Poor quality houses
Treaty of Versailles	Harsh Peace agreement signed by Germany following WWI
Unemployed	Without a job
Unsanitary	Unhygienic, leading to disease
Trenches	Ditches dug for protection in WW1
Welfare State	Government programmes to help people
Working Class	Poorer people
Western Front	Area of fighting between Germany and Britain/France

Year 9 Term 1 – Why is the Middle East an important world region?

Key words

- **Aquifers:** Underground sources of water.
- **Climatic zone:** An area with a similar weather throughout the year.
- **Colonialism:** The process by which one nation has control over another country which they have settled and taken over.
- **Colonist:** Someone who goes to live in a colony.
- **Conflict:** A disagreement between people.
- **Corruption:** where power is used for someone's personal gain.
- **Culture**: the ideas, customs and behaviour of a particular society.
- **Development Gap:** The difference in affluence (wealth) between richer and poorer countries.
- **Development Indicator:** Measures of development
- **Development:** The progress of a country in terms of economic growth, the use of technology and human welfare/wellbeing.
- **Dictatorship:** a form of government where one person is in control.
- **Diversify:** To change the economy to it buys and sells different items and makes money in different ways.
- **Ethnic group:** a community or a population made up of people who share a common cultural background.
- **Fossil fuel:** A natural fuel such as coal, oil or natural gas formed in the past from the remains of living organisms (plants and animals).
- **Migration:** Movement to another place.
- **Oil:** A liquid made from petroleum, a fossil fuel.
- **Peninsular**: an area of land almost surrounded by water or projecting (sticking out) into water.
- **Population density:** Amount of people living in a certain area.
- **Renewable energy:** Energy sources that will not run out when used, such as wind or solar power.
- **Sustainable:** Using something in a way it supports both present and future generations.
- **Tourism:** An industry that drives people to travel for recreation and leisure.

KPI 1 – What and where is the Middle East?

Location:

- Located where the continents of Asia, Africa and Europe meet. It is in SW Asia. It is surrounded by several seas, including the Red and Arabian Sea
- The River Tigris is the second largest river in western Asia and is one of the world's most important waterways.
- The Arabian Desert covers most of the Arabian **Peninsular** and is the second largest desert on Earth

Where does the name 'The Middle East' come from?

The term the Middle East was first used by European **colonists** in the 19th century. Traders used it as a way of separating this area from India in the Far East (*Southeast Asia and China*). After the Second World War, the Middle East became the main term for the whole region (*area*). The Middle East is an outsiders term describing the geography not the **culture**. This explains why different countries can be included in this region.

How was the Middle East influenced by Europe?

In 1916, representatives of Great Britain and France secretly reach an agreement, known as the Sykes-Picot Agreement. It agreed that most of lands under the rule of the Ottoman Empire were to be divided into British and French areas at the end of WWI.

Consequences: Different **ethnic** groups were split up and led to **conflict** across the region. Different communities had to ability to decide which country they were part of.

KPI 2 What is the climate like in the Middle East?

There are two main **climatic zones** in the Middle East: desert to the south and a Mediterranean climate to the North.

Climate Graphs: Used to present the climate of a region graphically. It uses both a bar graph and a line graph. Temperature is shown on a line graph. Rainfall is shown by a bar graph. Months of the year are shown along the bottom.

Analysing a climate graph – Statistical Skills

- ***Total****: Add up all the data sets i.e., add up all the temperatures throughout the year..*
- ***Mean****: Total temperature or precipitation ÷ the number of data sets.*
- ***Range****: Highest piece of data – the lowest piece of data.*
- ***Mode:*** *Most common piece of data*

What problems does the climate create in the Middle East?

Causes of water shortages:

- Extreme climate
- Rising population
- **Migration** to overcrowded cities
- Emptying of underground **aquifers**

Potential solutions:

- **Drip irrigation** – using small plastic pipes to water the roots of the crops (saves 40% of water used in farming)
- **Desalinisation** – removing salt from sea water to create more drinking water. It can only be used in areas with access to the ocean and can double salinity (*saltiness*) of water if dumped back into the sea.
- **Buying and selling water** – Countries which have surplus rainfall (*too much rainfall*) can sell water to other countries that a water deficit (*not enough water*)
- **Using water from underground aquifers** – underground rock is saturated with water that has been stored for thousands of years. This water can be extracted and used.

KPI3 - How is population distributed in the Middle East?

- Population of 411 million.
- Densely populated areas include coastal areas, capital cities and on rivers in the region (i.e., Nile valley in Egypt)
- Highest populations are in countries like Turkey, Syria and Iraq.

Reasons for high population density:

- Coastal areas have higher density i.e., capital cities on the Arabian **peninsular**
- Areas with access to rivers have a higher population density i.e., areas around the River Nile

Reasons for low population density:

- Arid (*hot and dry*) and inhospitable (*areas that are not easily to live in*) desert areas have lower density.

KPI 4 How developed is the Middle East?

Development indicators:

- **Access to healthcare**: how many doctors per 1000 people
- **Access to safe water**: % of people that have access to clean water
- **Literacy rate**: % of people aged 15+ that can read and write.
- **Daily calorie consumption**: Calories consumed per day
- **GNI per capita**: Total money earned in a country divided by the total population.
- **Infant mortality rate**: How many babies that do not survive past the age of 5.
- **Human development index**: an average of life expectancy, education, GNI.

Human and Physical factors contribute to uneven development:

- **Physical Factors**: Mountainous terrain, extreme heat and low rainfall, supply of oil.
- **Human Factors:** Rapid population growth, lack of government investment, conflicts, **dictatorships**, **corruption**; lack of investment.

Year 9 Term 1 – Why is the Middle East an important world region?

KPI 5 What is the importance of oil in the development of the Middle East?

Importance: **Oil** is an example of a fossil fuel it is used for many things such as; powering machines and vehicles it is also used in the production of plastic. However, it is non-renewable *(can run out).*

OPEC stands for Organisation of Petroleum Exporting Countries which includes countries such as Saudi Arabia, UAE, Iraq and Kuwait. 10 countries in the Middle East rely upon **oil** and petrol sales for their exports.

Why is oil important?

- **Oil** is necessary to produce a range of goods including medical equipment and for transports.
- **Oil** can be sold and generate a lot of income for Middle Eastern countries.

United Arab Emirates (UAE):

- The UAE is located in Asia, in the region of the Middle East and south of the Persian Gulf.
- In the 1960s it mainly relied upon fishing for income, and it had very little **oil**. Therefore, it **diversified** it's economy.
- It **diversified** by: creating a top luxury tourist destination, developing it's trade links, getting cheap labour (*workers*) from south Asian countries for construction, creating the world's largest tax-free zone *(do not have to pay taxes)*, launching Emirates Airline in Dubai, building the world's tallest hotel – Burj-Al-Arab, creating artificial (*man-made)* islands off the coast.
- After **diversifying**, only 1% of the economy relies upon **oil**.

KPI6 Impact of Climate Change on the Middle East

Six possible problems climate change will cause the Middle East:

- **Extreme temperatures:** Temperatures are set to rise in the region by at least 4°C by 2050. This will lead to a higher death rate for the population.
- **Rising sea levels**: The average global sea level is set to rise 30–122 centimeters (1 to 4 feet) by the end of the century, which would flood **aquifers** and wells and lead to some areas of farmland to be destroyed.
- **Water stress:** The cost of water in Jordan has increased by 30% over the past decade because of the lack of groundwater (*underground water)* from **aquifers.**
- **Displacement:** With areas being uninhabitable *(unable to live),* individuals will have to move.
- **Water conflict**: Since December 2020, Turkish dams have cut the flow of the Euphrates River to neighboring countries such as Iraq by 60 percent, which has also resulted in food and power shortages in Syria.
- **Desertification:** Desertification is *the process by which fertile becomes desert*. Large areas of the Middle East are becoming at risk of desertification.

KPI 7 Impact of tourism on Dubai

Why are migrants coming to Dubai?

- Strong economy
- Politically stable (*unlikely to see any conflict*)
- Modern infrastructure (*buildings and transport etc.*)

Who are the migrants?

- Low or semi-skilled workers come from Asia, other areas of the Middle East such as Syria and North Africa.
- High skilled workers in the **oil** and gas industry, as well as banking and finance come from United Kingdom, United States, Australia and Canada.
- Over 1.4 million people in the UAE are **migrants** and they are mainly male.

What problems do unskilled migrants face?

Until a few years ago if you came to Dubai to work in construction or housekeeping (or any low skill, low pay job) you had to let your employer hang on to your passport, had to ask for their permission to leave and get a new job. If they left without permission, they would lose their work permit and have to leave the country.

KPI 8 Causes of Poverty in Yemen

Yemen is classed as an LIC and is one of the poorest countries in the Middle East. It is an LIC because...

- **Conflict:** Up until the 1990s there were regular outbreaks of civil war between the North and South of Yemen.
- **Imports and exports:** Almost no products are exported. Most food is imported.
- **Government and wealth from oil:** **Corrupt** governments have misused the nation's wealth and **oil** reserves are running out.
- **Infrastructure:** No railways and many areas are inaccessible.
- **Gender equality:** Worst country for gender equality – almost 49% of Yemeni women are illiterate (*unable to read/write*)
- **Water:** 7th most water stressed country on the planet.

KPI 9 Israel and Palestine

There is a 100-year-old issue – Israeli Jews and Palestinian Arabs both want the same land and a compromise has been difficult. The Israeli-Palestinian **conflict** is over who gets what land and how it's controlled.

From an Israeli Jew's viewpoint: Palestine was not a country, it was just a part of the Ottoman Empire and then the British Empire. The land was legally given to the new country of Israel and happened to have Palestinian people living there. The land had been the **cultural** and religious home to Judaism for thousands of years.

From a Palestinian Arab's viewpoint: the inhabited the land and were **colonised** and occupied by the Ottomans and then the British. The British had no right to give the land to the new country of Israel as it was not theirs to give away, meanwhile Jewish **migrants** and settlers have occupied and taken Palestinian land

Suggested solutions:

1. The main approach to solving the conflict today is a so-called "two-state solution" that would establish Palestine as an independent state in Gaza and most of the West Bank, leaving the rest of the land to Israel.
2. The alternative to a two-state solution is a "one-state solution," wherein all of the land becomes either one big Israel or one big Palestine.

Year 9 Term 2 Knowledge Organiser – How dangerous are tectonic hazards?

KPI1 – What causes tectonic plates to move?

Structure of the Earth

1. **The inner core** is in the center and is the hottest part of the Earth. It is solid and made up of iron and nickel with temperatures of up to 5,500°C.
2. **The outer core** is the layer surrounding the inner core. It is a liquid layer, also made up of iron and nickel.
3. **The mantle** is the thickest section of the Earth at approximately 2,900 km. The mantle is made up of semi-molten rock called magma.
4. **The crust** is the outer layer of the Earth. It is a thin layer between 0 - 60 km thick. The crust is the solid rock layer upon which we live. It is either **continental** or **oceanic.** The earth's crust is broken into plates.

How do tectonic plates move?

Theory 1: Convection Currents

Heat rising and falling inside the mantle creates convection currents. The convection currents move the plates floating on the mantle. Where convection currents diverge (separate) near the Earth's crust, plates move apart. Where convection currents converge (move together), plates move towards each other.

Theory 2: Slab Pull

The denser plate sinks back into the mantle under the influence of gravity. It pulls the rest of the plate along behind it.

Theory 3: Ridge Push

Magma rises as the plates move apart. The magma cools to form new plate material. As it cools it becomes denser and slides down away from the ridge. This causes other plates to move away from each other.

KPI2 – How are tectonic hazards caused?

Destructive Plate Margin

1. A **destructive plate margin** usually involves an **oceanic** plate and a **continental** plate.
2. The plates move **towards** one another, and this movement can cause earthquakes.
3. As the plates collide, the oceanic plate is forced beneath the continental plate. This is known as **subduction**. This happens because the oceanic plate is denser (heavier) than the continental plate.
4. When the plate sinks into the mantle it melts to form magma. The pressure of the magma builds up beneath the Earth's surface. The magma escapes through weaknesses in the rock and rises up through a **composite volcano**. The volcanic eruptions are often violent, with lots of steam, gas and ash.

Constructive Plate Margin

1. At a **constructive plate margin** the plates move **apart** from one another.
2. When this happens the magma from the mantle rises up to make (or construct) new land in the form of a **shield volcano**.
3. The movement of the plates over the mantle can cause earthquakes.

Conservative Plate Margin

1. At a **conservative plate margin**, the plates move past each other or are side by side moving at different speeds.
2. As the plates move, friction occurs, and plates become stuck. Pressure builds up because the plates are still trying to move.
3. When the pressure is released, it sends out huge amounts of energy, causing an earthquake.
4. There are no volcanoes at a conservative plate margin.

KPI3 – Why are some volcanoes more dangerous than others?

Structure of a volcano

Volcanoes have distinctive features:

- **magma chamber** - this is where the molten rock is stored beneath the ground
- **main vent** - this is the channel through which **magma** travels to reach the Earth's surface
- **secondary vent** - some magma may escape through the side of the volcano, particularly if the main vent becomes blocked
- **crater** - this is found at the top of the volcano, where the magma erupts from.

Why do volcanoes erupt?

1. Hot, molten rock (magma) has a low density and will rise up through the crust to erupt on the surface.
2. If magma has large amounts of gas and a high viscosity (sticky) magma will form an explosive eruption.
3. If magma has a small amounts of gas and (or) low viscosity (runny) magma will form a gentle eruption. Where the magma just trickles out of the volcano (lava flow).

Types of Volcanoes

Shield Volcano - found on **constructive plate margins**, where two plates move away from one another. Shield volcanoes have the following characteristics:

- **basic lava**, which is non-acidic and very runny
- gentle sides as the lava flows for long distances before it solidifies
- no layers, as the volcano just consists of lava
- less violent eruptions
- shorter periods between eruptions

Composite Volcano – found when the oceanic crust sinks beneath the continental crust. Composite volcanoes have the following characteristics:

- **Acidic lava**, which is very viscous (sticky).
- Steep sides as the lava doesn't flow very far before it solidifies.
- Alternate layers of ash and lava. For this reason, they're also known as **stratovolcanoes**. Strato means layers.
- Violent eruptions.
- Longer periods between eruptions.

Year 9 Term 2 Knowledge Organiser – How dangerous are tectonic hazards?

KPI4 – What hazards are produced by volcanoes?

1. **Pyroclastic flows** - A pyroclastic flow is a thick cloud of volcanic ash and gas. As they are heavier than air, they flow from volcanoes down into valleys. Pyroclastic flows move at speeds of over 100km per hour and can easily flow 8km from a volcano. The temperatures inside a pyroclastic flow can be between 200°C and 700°C, meaning it burns and destroys everything in its path.
2. **Ash clouds** - Volcanic ash is a mixture of rock, mineral, and glass particles expelled from a volcano during a volcanic eruption. The particles are very small—less than 2 millimeters in diameter. Due to their tiny size and low density, the particles that make up volcanic ash can travel long distances, carried by winds. Volcanic ash can be dangerous because its particles are very hard and usually have jagged edges. As a result, it can cause eye, nose, and lung irritation, as well as breathing problems. Also, while in the air, ash can cause problems for jet engines, forcing airlines to cancel flights through the affected area.
3. **Volcanic bombs** - Volcanic bomb is pyroclastic rock that is a cooling of a mass of lava it flies thorough the air after eruption. If it is to be called a bomb, a specimen must be larger than 2, 5 inch diameter. Volcanic bombs are heavy and often fly at high speed. However, bombs do not travel very far.
4. **Lahars** - A lahar is a fast-flowing mudflow (up to 70km per hour) that is made up of volcanic ash and either:
    a. Hot water (from the lake in the volcanoes crater) or,
    b. Cold water (from melting snow and ice). Lahars have a texture very similar to concrete.
5. **Volcanic flows** - Lava flows are streams of molten rock that pour or ooze from an erupting vent. The speed at which lava moves across the ground depends on several factors including:
    a. type of lava erupted and its viscosity
    b. steepness of the ground over which it travels
    c. whether the lava flows as a broad sheet, through a confined channel, or down a lava tube
    d. rate of lava production at the vent.

Everything in the path of an advancing lava flow will be knocked over, surrounded, buried, or ignited by the extremely hot temperature of lava. Deaths caused directly by lava flows are uncommon because most move slowly enough that people can move out the way easily.

KPI5 – Why do people live near tectonic hazards?

1. **Geothermal Energy:** Water is pumped into permeable rock, the natural heat in volcanic areas turns that water into super-heated steam, which turns the turbine to create electricity. 30% of Iceland's electricity is Geothermal energy.
2. **Farming:** Weathering of volcanic lava & ash leaves fertile soil rich in nutrients. Farming in volcanic soils supports 10% of the world's population.
3. **Mining:** Volcanic eruptions create minerals which generates thousands of jobs. Sulphur from Indonesia is used to bleach sugar, make medicines , matches & fertiliser.
4. **Tourism:** More than 100 million tourists visit volcanic sites every year, generating thousands of jobs and income for countries.

KPI8 – What causes tsunamis?

A tsunami can be triggered by events like landslides and volcanoes, however most tsunamis are caused by earthquakes at destructive plate boundaries.

1. A sudden shift in plate movement causes water displacement at the epicentre
2. Large waves move along the seabed away from the epicentre
3. As the waves move from deep water to shallow water near the coastal area, they increase in height and break

KPI9 – How can we manage tsunamis?

Sea Wall: In Japan sea walls up to 14 metres high have been built to offer two key protections:

1. Bouncing back the power of the waves, which reduces damage
2. Buying time for evacuation.

Early Warning System: The Pacific Tsunami Warning System is made up of a network of seismic-monitoring stations and sea level gauges. These detect earthquakes and changes in sea level.

KPI6 – Can people manage risk living near volcanoes?

- **Prediction**: Volcanologists monitor volcanoes all over the world and take readings to determine change so they can predict when a volcano is likely to erupt. One method of prediction is thermal imaging.
- **Planning**: Helps communities to respond and recover from a natural disaster, such as a volcanic eruption. It includes drawing up evacuation plans and using hazard maps to prevent building in high risk areas where lava might flow.
- **Preparation**: Involves educating people on what to do if a volcano erupts such as preparing leaflets and videos giving advice on how to protect yourself.

	KPI8- describe and explain the causes, impacts and responses of the Boxing Day Tsunami
Location and cause	26 December 2004 The earthquake measuring more than magnitude 9. The earthquake caused the seafloor to uplift, displacing the seawater above.
Impacts	250.000 people died. Two million people were made homeless. People were swept away in the waters, which arrived rapidly and with little warning. Thirteen countries were affected, the worst being Indonesia. Indonesia was hit by the tsunami first. Forty-five minutes later the tsunami reached Thailand.
Responses	Short-term aid, such as water purification tablets, temporary housing and medical supplies were given from international countries. Islands reliant on tourism and fishing, such as the Maldives, had to rebuild their industries. An early warning system between countries surrounding the Indian Ocean has been set up.

Year 9 Term 1 French – Equality and Divesity

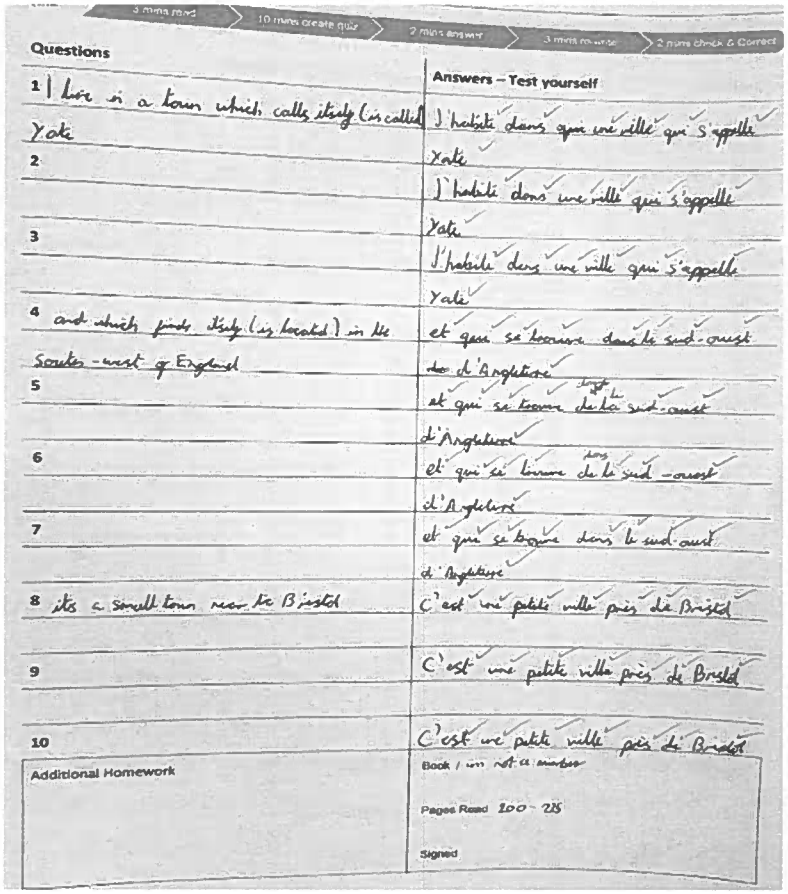
1	Je pense qu'il faut respecter l'identité de chacun	I think that we must respect the identify of everyone
2	Je dirais qu'il devrait lutter contre le chômage	I would say that we should fight against unemployment
3	Il est important de traiter avec respect les droits des animaux	It is important to treat with respect the rights of animals
4	On peut être égal	we can be equal
5	la personne que j'admire c'est une sportif	The person that I admire is a sportswoman
6	Je peux m'identifier avec lui/elle	I can identify with him/her
7	Mon modèle célèbre c'est un blogueur	My famous role model is a blogger (m)
8	car il a contre le harcèlement	because he fought against bullying
9	Il est sûr de lui	He is self-confident

10	Elle est née en	She was born in
11	Il est devenu acteur	He became an actor
12	Tous les jours je me lève et je m'habille	Everyday I get up and I get dressed
13	mais hier je me suis levé(e) et j'ai pris le petit-déjeuner	but yesterday I got up and I had breakfast
14	Le weekend dernier j'ai dormi and je me suis reposé(e)	Last weekend I slept and I relaxed
15	J'ai chaud et j'ai soif	I'm hot and I'm thirsty
16	J'ai mal au corps depuis avant-hier	I have pain in my body since the day before yesterday
17	Pour rester en bonne santé j'essaie de manger des fruits et des légumes	In order to be in good health, I try to eat fruit and vegetables
18	Pour réduire le stress je tente de participer à des activités sportives	In order to reduce stress I attempt to participate in sport activities

MFL classroom language

Key Word	Definition	Example
Infinitive	In English it is always accompanied by the word **"TO"**. In French, it always ends in **ER/IR/RE** E.g: **to** play, **to** do, **to** go, **to** go out. jouer / faire / sortir	An opinion is always followed by an infinitive: J'aime jouer/ faire/ acheter I like **to play/to do/to buy**
Cognate	A word that is similar in spelling and meaning in two languages	This word is a cognate, what do you think it means? e.g. télé-réalité = TV reality
Connectives	A word that links two sentences or ideas together, e.g. et / cependant	What connective can we use to link these two sentences ? • j'aime l'histoire **(mais)** je déteste l'anglais • I like history **but** I hate English
Intensifiers	A word that strengthens the meaning of other expressions and shows emphasis, e.g. très/assez	Every time you write an adjective, make sure you use an intensifier before it. • je pense que le sport est très important

Example of what LSQs for MFL should look like:



Year 9 Spanish – Equality and Diversity

English	Spanish
1.Pienso que se debe respetar	I think we should respect
2.La identidad de todos	Everyone's identity
3.A los hombres y mujeres	men and women
4.La diversidad y la identidad	The diversity and the identity
5.Es necesario tartar con respeto a todos	Is necessary to treat with respect to everyone
6. Es importante poder casarse con quien sea	Is important to be able to marry anyone
7.Poder compartir la vida con quien sea	To be able to share life with anyone
9.A pesar de su nacionalidad	Despite their nationality
10.A pesar del color de la piel	Despite the skin color
11.Hay que luchar en contra del raismo	We must fight against racism
12.Se puede ser rico/pobre	You can be poor/rich
13.Tener los mismos derechos	To have the same rights
14.Sentirse igual/incluido	To feel iqual/ included

15.Mi modelo a seguir es	My role model is
16.Porque trabaja duro	Because he/she works hard
17.Lucha por los derechos de las mujeres	He/she fights for women's rights
18.Me identifico con	I identify with
19.Porque lucha contra la discriminacion	Because he/she fights against discrimination
20.Ayuda a otra gente	Helps other people

MFL- Classroom language

Key Word	Definition	Example
Infinitive	In English it is always accompanied by the word **"TO"**. In French, it always ends in **ER/IR/RE** E.g: **to** play, **to** do, **to** go, **to** go out. jouer / faire / sortir	An opinion is always followed by an infinitive: J'aime jouer/ faire/ acheter I like **to play/to do/to buy**
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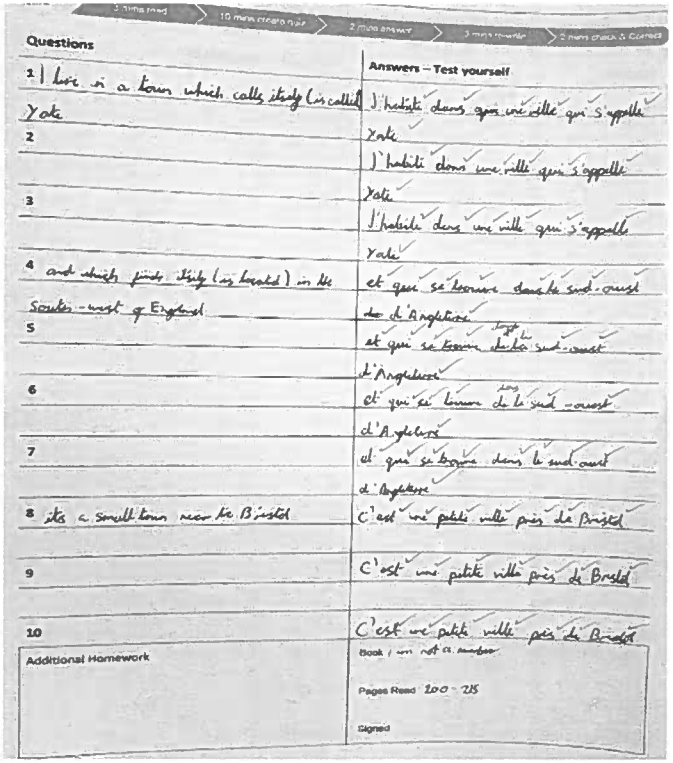
MFL-LSQ example



Questions	Answers – Test yourself
1 I live in a town which calls itself (is called) Yate	J'habite dans une ville qui s'appelle Yate
2	J'habite dans une ville qui s'appelle Yate
3	J'habite dans une ville qui s'appelle Yate
4 and which finds itself (is located) in the South-west of England	et qui se trouve dans le sud-ouest de l'Angleterre
5	et qui se trouve dans le sud-ouest d'Angleterre
6	et qui se trouve dans le sud-ouest d'Angleterre
7	et qui se trouve dans le sud-ouest d'Angleterre
8 its a small town near to Bristol	C'est une petite ville près de Bristol
9	C'est une petite ville près de Bristol
10	C'est une petite ville près de Bristol
Additional Homework	Book I am not a member Pages Read 200 - 215 Signed

Key terms

Conflict - a serious disagreement or argument

Peace- a state or period in which there is no war or a war has ended.

Justice- Just behaviour/treatment through the quality of fairness

War- a state of armed conflict between different countries or different groups within a country.

Civilians- a person who is not involved in the armed service

Retaliation- the action of harming someone, or seeking revenge

Greed – a selfish desire to want something,

WMDs- Weapons of mass destruction

Hiroshima- On Monday 6th August 1945, during WWII, America dropped the first atomic bomb over the Japanese city of Hiroshima

Pacifism- The belief that all war and violence are unjustifiable

Sanctity of life- The religious belief that all life is sacred and holy, as life is God given

Ahisma- Hindu/Buddhist term to respect all living things and avoid violence towards others- linked with the first moral precept 'do not harm'

Conscientious objector- A person who refuses to fight in a war for religious or moral reasons.

Quakers- a member of the Religious society of friends, a Christian denomination, following the teaching of peaceful principles.

Year 9 term 1- Is religion a source of peace?

KPI1: To understand why wars are fought.

What is war?

War is an organised conflict usually consisting of intense violence carried out by one state or states against another state or states.
What are the causes of conflict?
The causes of any war are complex. Wars are rarely about just one thing. They can be declared when a state or states act to: attack or invade another state, to gain territory or resources, resist such an attack or invasion by an aggressor, protect another state from attack by an aggressor, impose domination or political change on another state, or to resist such domination.

War can also occur internally within a state between organised groups. **This is known as civil war.**
https://www.bbc.com/bitesize/guides/zbygjxs/revision/1

KPI2: To explore Christian attitude towards the reason for war

In the Old Testament, people are sometimes commanded by God to go to war. In Deuteronomy, Joshua and Judges, God often tells his people to fight and destroy foreign tribes to gain the Promised Land (Israel).
- "The lord your God will drive out those nations before you." Deuteronomy 7:22-24 The Old Testament Prophet, Joel, tells the people that God wants them to go and fight,
- "Prepare for war! Rouse the warriors! Let all the fighting men drawn near and attack." Joel 3:9-10
- "The Lord is a warrior." Exodus 15:3
- "There is a time for killing, and a time for healing, a time for war, and a time for peace." Ecclesiastes 3:2-8

Christians use these quotes in a discussion about war and the use of violence to show that there are times when war is justified. God cannot be totally opposed to war in all circumstances.

KPI4: To explain religious views on pacifism

Pacifists reject all violence. They do not think that conflict should be dealt with by resorting to war. They think that other peaceful methods should be used. In the Gospel of Matthew, Jesus said: Blessed are the peacemakers: for they shall be called the children of God. Pacifists also use the teaching in the Ten Commandments to justify their position. In Exodus it says: Do not murder.
Martin Luther King was a Pacifists who used methods of nonviolence; speeches, marches, bus boycotts.
The Five Precepts are moral guides that all Buddhists try to follow in order to minimise desires and reach enlightenment. The first of these Precepts is to abstain from taking life. Killing or harming human beings is therefore clearly problematic for Buddhists. Because of this, some Buddhists would not rise to an attack or to any conflict with violence.
For many, Hinduism is a religion which follows pacifist principles because there are clear reasons to lead a non-violent lifestyle, they believe in the concept of ahimsa good merit is built up by avoiding violence
all living things are believed to have equal worth and should not be harmed

KPI3: To investigate arguments around WMDs

Weapons of mass destruction (WMDs) are weapons that can kill a large number of people causing great damage to the environment. Examples include nuclear weapons (bombs using radioactive material); biological weapons (weapons infecting people with disease) and chemical weapons that burn people. Some people support the right to have these saying that they keep peace as countries will not attack other countries if they have got nuclear weapons. Many people are against them as they result in civilian casualties and lasting environmental impact. They could even destroy the world. Many people say that since they are bound to kill civilians using them would mean that a just war would no longer be possible.

Year 9 Term 1 RE- Is religion a source of peace?

Essential Texts KPI 5	
In the Old Testament, people are sometimes commanded by God to go to war. In Deuteronomy, Joshua and Judges, God often tells his people to fight and destroy foreign tribes to gain the Promised Land (Israel).	In the New testament Jesus showed a DIFFERENT image of God as one who forgives and Loves all human beings:
•"The lord your God will drive out those nations before you." Deuteronomy 7:22-24 The Old Testament Prophet, Joel, tells the people that God wants them to go and fight,	"While he was still a long way from home his father saw him" (The Lost Son story) Luke 15: God is waiting to forgive us
• "Prepare for war! Rouse the warriors! Let all the fighting men drawn near and attack." Joel 3:9-10	"Blessed are the Peacemakers"
•"The Lord is a warrior." Exodus 15:3	"Those who live by the sword, will die by the sword" (Matthew 26:)
•"There is a time for killing, and a time for healing, a time for war, and a time for peace." Ecclesiastes 3:2-8	'Do not take revenge on those who wrong you' Matthew 5
	"Love Your Enemies and pray for those who persecute you" Matthew 5
Buddhism: As a pacifist religion there are many key quotes which could be used:	
"It's better to conquer yourself than to win a thousand battles. Then victory is yours" The Buddha	
"In the war of the ego the loser always wins"	
"War ends only when people love each other"	
1st Moral precept "Do not Harm"	

KPI 6

Holy Wars: A Holy War is a war which is fought for religious reasons, often with the backing of religious leaders.

- An example of this was the Crusades fought from the 11th-14th Century by Christians, backed by the Pope.
- Religion can still be a cause for war today such as in Northern Ireland where Protestant and Catholic Christians fought a civil war between 1968-98.

KPI7

Pacifism: Pacifists reject all violence. They do not think that conflict should be dealt with by resorting to war.

- They think that other peaceful methods should be used.
- The early Christian communities were all Pacifist as they followed Jesus' teachings on Non-Violence. "Those who live by the sword will die by the sword"
- Famous Pacifists today such as Martin Luther King Jr and Mahatma Gandhi are examples of non-violence in action.
- Buddhism is a religion of non-violence. The first of the five moral precepts is Ahimsa which means first cause no harm to anyone or anything.
- Pacifism is the idea that all forms of violence are wrong. Pacifists such as Quakers refuse to take part in war and often choose to be a conscientious objector (someone who doesn't go to war for moral reasons) or to assist in medical tasks like ambulance driving.
- Christians try to follow Jesus' teaching that "blessed are the peacemakers"

KPI8

Responses to war:

- Christians try to show mercy and agape to victims of war and provide them with assistance.
- This can be through charity or through welcoming them into their churches. It can be victims in their own country or refugees such as people fleeing from Syria or Yemen.
- This is an example of 'love your neighbour' in action.
- Many Christian charities work around the world in countries affected by war. CAFOD (Catholic Agency for Overseas Development) is an example of a Christian charity that helps people and refugees in countries affected by war and natural disasters.

Year 9 Unit 5 -Python

Lesson 1

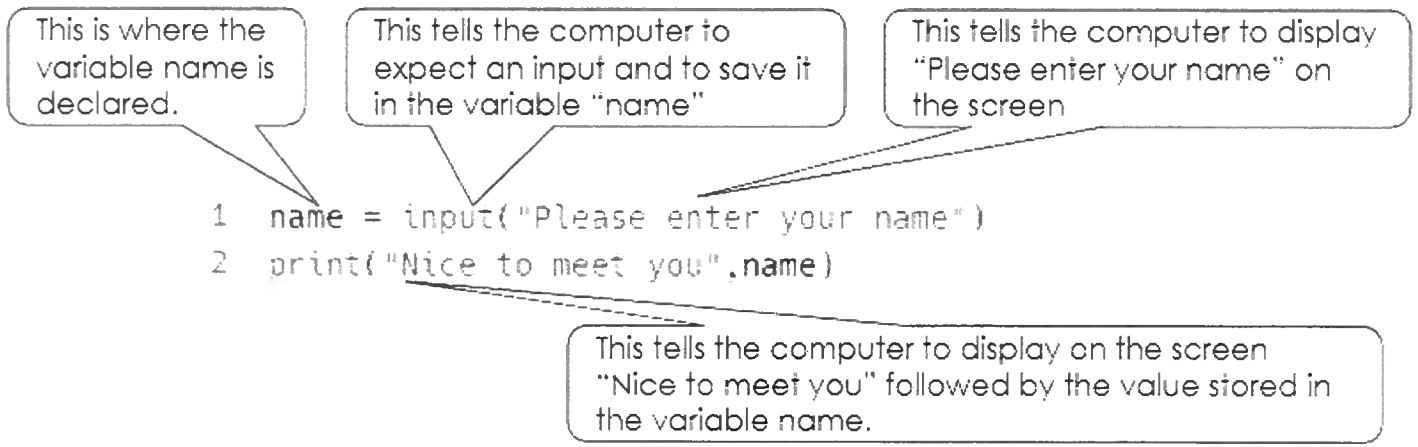
Describe what algorithms/sets of computer instructions and programs are and how they differ.

An algorithm/set of computer instructions is a set of instructions created in order to solve a problem. An algorithm/set of computer instructions is written in what is known as pseudocode. Pseudocode is written similar to how a program is written but without all the syntax (commas, brackets, colons etc)/ (the set of rules for forming language). A programmer will then take the pseudocode and turn it into a computer program. Algorithm/Sets of computer instructions s are similar/are just like to a program but they are not written using a programming language.

What needs to happen to a completed computer program before it can be executed/ran/run by the computer?

Programming languages have been developed to help humans write computer programs. A computer cannot directly understand the programs that are written. They must first be converted into binary form (1's and 0's) using a translator. Only then can a computer execute/run those programs.

Give an example of a simple Python program that displays a message,assigns a value to a variable/(number or thing that changes), and receive keyboard input



Keywords

Algorithm/Set of computer instructions
An algorithm/Set of computer instructions is a list of instructions, used to solve problems or perform tasks/(do/complete).

Program
A program is a set of operations for a computer to perform/(do/complete).

Programming language
A programming language is a language that can be used to control a computer.

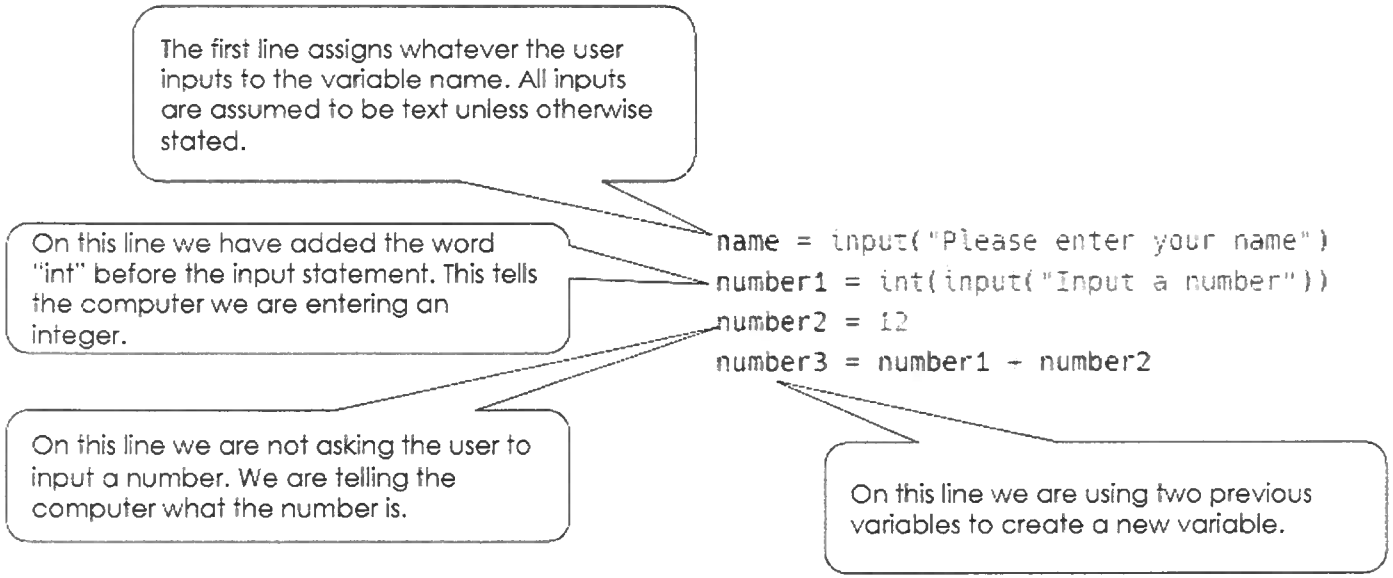
Program translation
A translator is a program that converts source code (python) into code that the computer can use.

Program execution
To execute/run a program is to run the program in the computer,

Interpreter
A computer program that directly executes instructions written in a programming language

Lesson 2

Describe the semantics/(meanings of words) of assignment statements



Use simple arithmetic expressions in assignment statements to calculate values

```
length = 4.5
width = 3.76
area = length * width
perimeter = length * 2 + width * 2
```

Receive input from the keyboard and convert it to a numerical value

See example for variable/ (number or thing that changes) **number2** above.

Programming environment/(surrounding conditions)

A program that contains language specific/clearly stated/particular editors and source level debugging/(finding and correcting mistakes in) facilities. (Replit.org)

Input

Data that is entered into or received by a computer

Output

The information that it displays on a screen or prints on paper as a result of a particular program.

Variables/(numbers that change/things that change)

A variable/(numbers that change/things that change) is a value that is stored by a computer.

Assignment

A statement in computer programming that is used to set a value to a variable.

Operators

An operator is a specific mathematical or logical action or process.

Expressions

A combination of values and functions that are combined to create a new value

Lesson 3

Lesson 3

Describe how to use binary selection to control the flow of program execution.

On the first two lines variables a and b are set to values 1 and 2.

On this line we are using an IF statement to check if a is equal to b using the double equals. (==)

If they are equal we set c = a.

If not then we set c = b.

```
a = 1
b = 2
if a == b:
  c = a
else:
  c = b
print(a,b,c)
```

Describe how to use random integers e.g.,

We need to tell the computer we are using a library of ocde called random

On these lines we are setting a and b to random numbers between 1 and 10.

If they are equal we set c = a.

If not then we set c = b.

```
import random
a = random.randint(1,10)
b = random.randint(1,10)
if a == b:
  c = a
else:
  c = b
print(a,b,c)
```

Integer and string type

Integer is a numeric/number-based value, while string is a character value represented in quotes.

Execution

To execute/ run a program is to run the program in the computer

Selection

Where a section of code is run only if a condition is met

Relational operators

Relational operators compare numeric/number-based, character string, or logical data. The result of the comparison, either true (1) or false (0). Examples include =, > < and <>.

Logical (or Boolean) expressions

An operation involving the use of logical functions, such as AND or OR.

Conditions

Conditions are statements which evaluate/(figure out the worth, amount, or quality of) if something is true or false.

Multi-branch selection

Where the flow of a program can go in many different directions depending on a particular value.

		Iteration/Cycle A sequence of instructions or code being repeated until a specific end result is achieved/(**accomplished or gained with effort**). **Flags** A flag is a variable(**number or thing that changes**) that acts as a signal within a program.

Lesson 4	**Explain how multi-branch selection (if, elif, else statements) can be used to control the flow of program execution.**

We need to tell the computer we are using a library of ocde called random

On these lines we are setting a to a random numbers between 1 and 10.

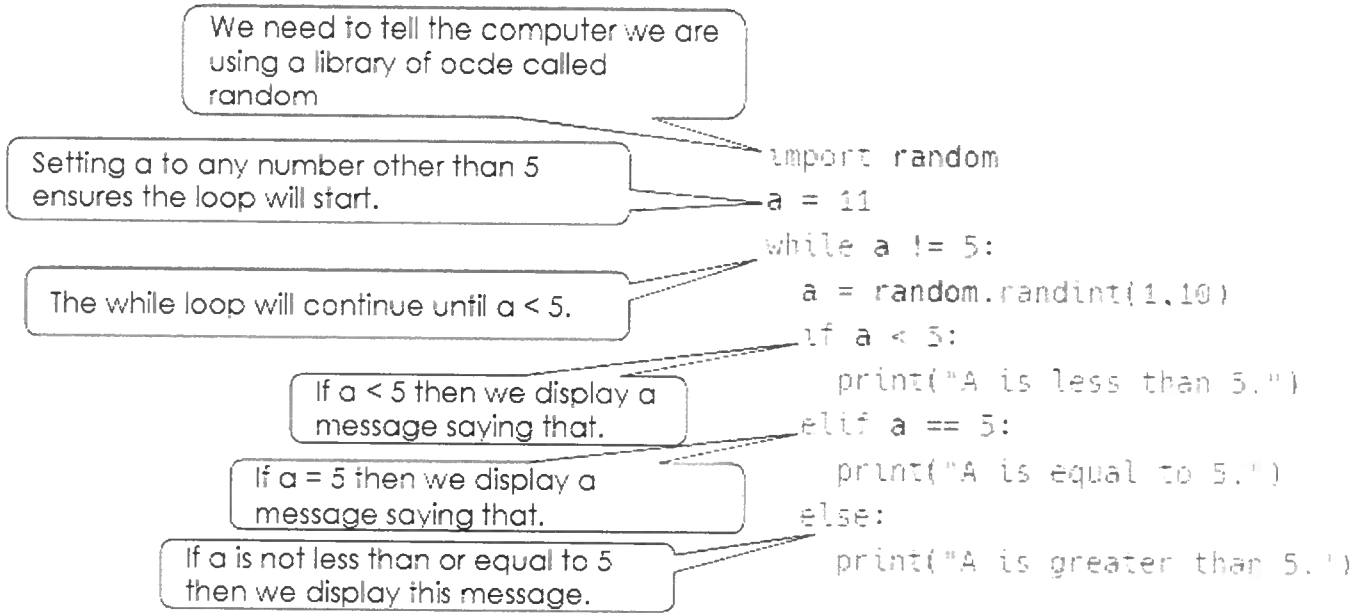
If a < 5 then we display a message saying that.

If a = 5 then we display a message saying that.

If a is not less than or equal to 5 then we display this message.

```
import random
a = random.randint(1,10)
if a < 5:
  print("A is less than 5.")
elif a == 5:
  print("A is equal to 5.")
else:
  print("A is greater than 5.")
```

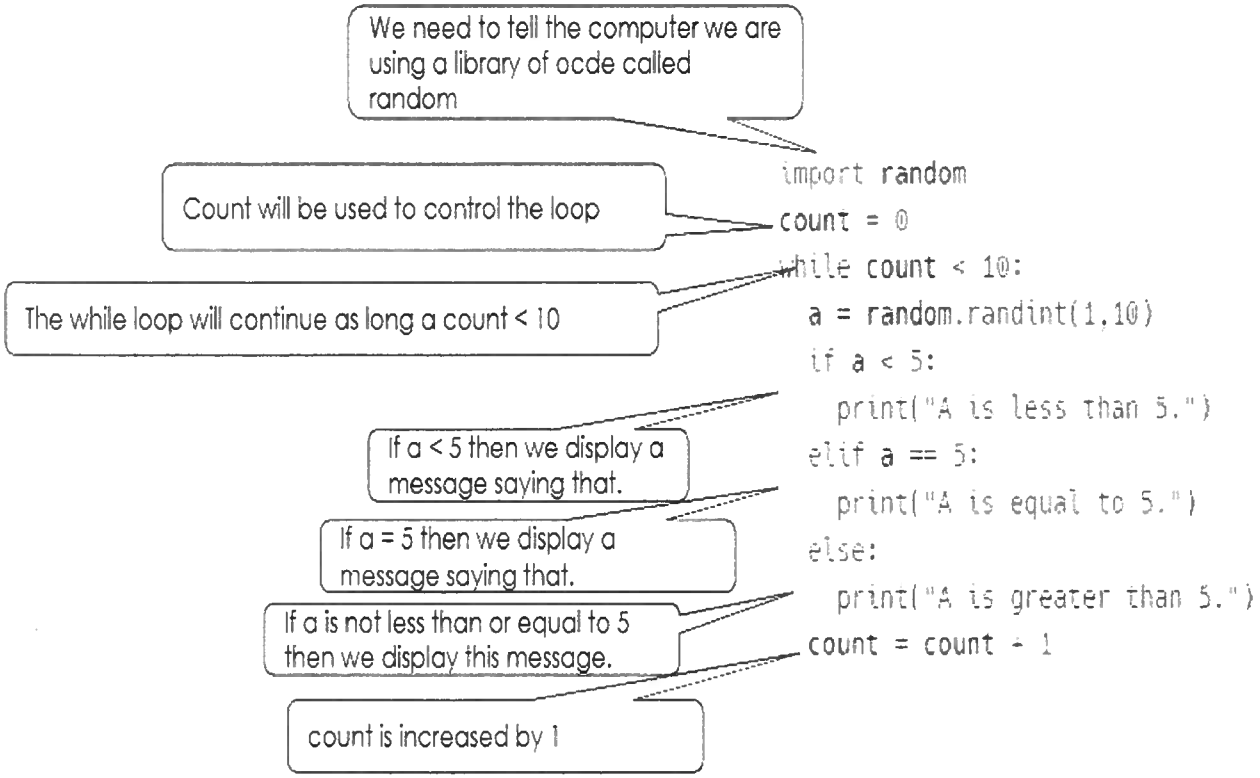
Explain how iteration/cycle (while statements) controls the flow of program execution



Lesson 5

Use iteration/cycle (while loops) to control the flow of program execution

Use variables/ (numbers that change/things that change) as counters in iterative/repeating/repetitive programs



Lesson 6

Combine iteration/cycle and selection to control the flow of program execution

Use Boolean variables/(numbers that change/things that change) as flags

We need to tell the computer we are using a library of ocde called random

loop controls the while loop and is set to **True**

The while loop will continue as long a loop = True

If a < 5 then we display a message saying that.

If a = 5 then we display a message saying that. We then set loop to False to stop the loop.

If a is not less than or equal to 5 then we display this message.

```
import random
loop = True
while loop == True:
    a = random.randint(1,10)
    if a < 5:
        print("A is less than 5.")
    elif a == 5:
        print("A is equal to 5.")
        loop = False
    else:
        print("A is greater than 5.")
```

Lesson 7	**Perform common operations on lists or individual items**
	`fruit = ["apple","banana","pear","pineapple"]`
	`print("The first fruit in the list =",fruit[0])`
	`print("The second fruit in the list =",fruit[1])`
	`fruit.append("cherry")`
	`fruit.insert(1,"grape")`
	`fruit.pop(3)`
	`fruit.remove("apple")`
	`fruit.sort()`
	`print(fruit)`

Lesson 8	**Use iteration (for statements) to iterate over list items**
	`print("Enter the first piece of text: ")`
	`text1 = input()`
	`for i in range(0,len(text1)-1):`
	`  print(text1[i])`
	
	`print("Enter the times table you wish to see: ")`
	`timesTable = int(input())`
	`for i in range(1,13):`
	`  print(i,"*",timesTable,"=",timesTable*i)`

Year 9 – Food Technology

Malnutrition (Deficiencies/Excesses & Effects on Health)

Malnutrition	There is a link between a poor diet, and the risk of developing some diseases. This includes the risk of: *cancer; *Coronary heart disease (CHD); *bone health; *anaemia. Having intakes of energy and/or nutrients below or in excess of needs for long periods of time can affect health. The risk of malnutrition is increased by: *increased requirements for some nutrients *restricted range of foods; *reduction in available income; *very low income; *medical conditions; *psychological conditions.
Undernutrition	Worldwide, Kwashiorkor and marasmus are two common diseases caused by a lack of protein and energy. Fat soluble vitamins (A, D, E and K) are stored in the body so it takes time for deficiency diseases to develop.
Diet and Cancer	The World Cancer Research Fund has released nine cancer prevention recommendations *Be a healthy weight *Move more *Avoid high-calorie foods and drinks *Enjoy more grains, veg, fruit and barley. Limit intake of red meat and avoid processed meat *Don't drink alcohol *Eat less salt *Don't rely on supplements. Breastfeed your baby.
Diet & Coronary Heart Disease	It is believed that 80% of CHD and strokes could be prevented by changes to lifestyle factors, such as diet, physical activity and smoking. Changes to the diet to reduce the risk of CHD include: *increasing oily fish intake; *reducing salt intake; *increase fruit and vegetables; *decreasing alcohol consumption.
Bone Health	Calcium is important for strong bones. Vitamin D is needed for calcium to be absorbed from food.
Anemia	Iron is vital for making red blood cells. Iron from the diet forms haemoglobin, which carries oxygen in the blood. Anaemia develops if the body's stores of iron are too low.
Obesity	People who are obese are more likely to suffer from CHD, type 2 diabetes, gall stones, arthritis, high blood pressure and some types of cancers, i.e. colon, breast, kidney and stomach.
Inactivity	It is also important that the amount of time being sedentary is reduced. Over time, sedentary behaviour can lead to weight gain and obesity, which can increase the risk of developing chronic diseases in adulthood.

Food Labelling

Packaging Information	Information on the labels of pre-packed food and drink products can be legally required or just for consumer information. Legally required information is: country of origin and place of provenance (where an ingredient is from); date mark; list of ingredients (including additives and allergens); name and address of the manufacturer, packer or seller; name of food or drink; nutrition information; storage and preparation instructions; weight or volume. Consumer information (not a legal requirement) front-of-pack nutrition label; price; serving suggestions/image.

Year 9 – Food Technology

Functional Characteristics of Ingredients

Selecting Ingredients	Ingredients are chosen for a number of reasons, *to add flavour, colour or texture *to provide a particular function, e.g. to thicken *to provide nutrients or change the nutritional profile of a dish, e.g. to increase fibre *to extend the shelf life, e.g. vinegar for pickling or chemical preservatives *cost and availability, e.g. fruit in season *to satisfy a need to buy food with a certain provenance, e.g. Red Tractor.
Adding Flavour, Colour or Texture	• Fresh and dried herbs and spices can be added to dishes to provide flavour and replace the salt in some dishes, • Fruit, vegetables, herbs and spices can all be used in recipes to add colour. • Nuts, seeds, grains, fruit and vegetables can be added to recipes to provide texture. • The cooking method and cooking time can impact the texture, e.g. steaming or microwaving vegetables quickly can retain their colour, flavour and firm texture. • Equipment used to process food can impact the texture - blending soup for a smoother texture.
Ingredient functions in recipes	**browning**, e.g. flour in a bread roll (dextrinisation); **raising**, e.g. yeast in bread (aeration); **setting**, e.g. scrambled eggs (coagulation); **thickening**, e.g. flour in a roux sauce (gelatinisation).
Raising Agents	**mechanical**, e.g. beating, creaming, rolling and folding, sieving, whisking; **chemical**, e.g. baking powder, baking powder, self-raising flour; **biological**, e.g. yeast. Different foods may use one or more of these to achieve a desirable end result.
Tenderisation	Mechanical tenderising – a meat cleaver or meat hammer may be used to beat the meat. Cutting into small cubes or mincing can also help. Chemical tenderisation (marinating) –the addition of any liquid to flavour or soften meat before cooking.

Glossary

Key Terms	**Aeration**: Incorporating air into a mixture. **Caramelisation**: The chemical change of heated sucrose (sugar) to caramel, which produces flavour and browning. **Coagulation**: The irreversible denaturation of protein molecules to thicken and set. **Denaturation:** A change in the structure of protein molecules, resulting in their unfolding. **Dextrinisation**: The reaction of dry heat on the surface of food which changes starch to dextrin, e.g. toast. **Gelatinisation**: The process of thickening which takes place when a mixture of starch and liquid is heated. **Shortening**: The effect caused when fat is rubbed into flour (rubbing in method - crumble. The fat coats the flour particles, waterproofing them to prevent gluten formation. **Allergen:** An ingredient that may cause an adverse reaction to food. **Back-of-pack labelling**: Is legally required and can help consumers make healthier choices. **Front-of-pack labelling**: Is voluntary but must provide certain information and can use red, amber and green colour coding. **Use-by-date:** Relates to the safety of the food. Food must be eaten by this date. **Best-before-date:** Relates to the quality of the food. Food may still be eaten beyond this date.

Design & Technology Year 9

The 6 R's

The 6 Rs are an important checklist. They are used by designers to reduce the environmental impact of products. They can also be used to evaluate the environmental impact of other products.
The hierarchy of sustainability places the strategies that are best for the planet about those that have a greater negative impact on the environment.

1. Refuse

The first stage in the process is to ask whether the proposed product, part, purchase or even journey is required at all. Asking the question 'Is it really necessary?' can play a major role in reducing the demand on materials. Simply not using something saves 100% of what you have chosen not to use. Example include:

- Using your own carrier bag rather than purchasing a new one.
- Walking or cycling to school instead of being driven.
- Not using products such as some pesticides that are known to be harmful to the environment.
- Not eating (or using) products that are over-farmed, over-fished or on the endangered list.

2. Rethink

Consumers have a growing number of choices to make about where and on what they spend their income. Greener and more sustainable options are not always the cheapest or the best, but making informed decision and rethinking ones spending power can play a huge part in conserving resources.
Deciding on the design of a product, e.g. the materials being used in its production, will directly affect its sustainability. The types of questions designers need to ask are:

- Are the materials locally sourced?
- Are they sustainably produced?
- Is it essential to use this material, of which there is a finite supply?

By rethinking how the product is likely to be made, the product can often be redesigned in a more responsible way.

3. Reduce

Reduction is often the result of having re-thought a design or action. Materials and energy are saved due to efficient manufacturing practices and the use of clever design, incorporating sustainable materials.

- Modern materials that are lighter and stronger than traditional ones have contributed to the miniaturisation of products, saving material and energy in manufacture and use.
- Reducing the complexity or number of parts a product uses and reducing the number of different materials in a product makes recycling easier.
- In factories, schools and hotels, fitting motion sensitive lighting and smart heating systems can significantly reduce energy usage.
- Many large companies employ staff to conduct 'energy walks' to turn off unused appliances and lights and to ensure windows and doors are shut to conserve heat.

4. Reuse

Reusing products multiple times for the same purpose is also known as **primary recycling.** Reusing a product in a different way from the one it was designed for is known as **secondary recycling.**
The classic glass milk bottle is reused many times before it reaches the end of its useful life, as which point it is recycled. A plastic milk bottle, however, is intended to be used only one, although it can have many different subsequent uses.
Donating to and buying from charity shops extends the life of products and in recent years there has been a resurgence of in products having second lives, thanks to websites such as eBay, Freecycle or Gum tree.

ebay freecycle Gumtree

It is also becoming popular for furniture and other household items to be **upcycled** with a coat of paint and some minor repairs or adaptations, extending their useful life by many years.

5. Repair

Being able to repair a product when it is broken or worn is a way of extending its life and delaying the purchase of a new one. Repairing is a positive option over replacement as it means that only some parts of the product are replaced. This creates jobs for skilled people who conduct repairs and stimulates a spare parts market.
Unfortunately, repairing products has become harder over years. Growing number of products are not design to be repaired. There are a number of reasons why items may be designed this way, but it is usually because they are cheaper to replace than repair. Some products, especially modern electronic products, are designed to last only a few years as technology dates quickly and older products will be superseded by newer, faster, more efficient models. This is called **planned obsolescence.**

6. Recycle

Tertiary recycling, although a very important stage, is lower down the hierarchy of preferred options because most materials that are recycled this way tend to be of lower quality than the original material. It takes a lot of energy to recycle materials.
This form of recycling requires the reprocessing of the material and in many cases involves chemicals and/or heat to recover the recycled materials. In an ideal world, tertiary recycling would remove all recyclable materials from our household waste so that only biodegradable materials would be left. Only very few parts of the world are set up to cope with this level of processing.

7. Sustainability

Our planet has to provide all of our basic human needs, such as food, shelter and warmth.
Designers now have a much better understanding of which materials are sustainable and which are not.
The general principle is that resources fall into two categories:
Finite resources – are ones which are in limited supply or cannot be reproduced.
Non-finite resources – are ones which are in abundant supply and are unlikely to be exhausted.

8. Recyclable materials

Once all useful and recyclable materials are removed, the majority of the remaining waste is organic matter and can be processed in one of two ways; **'Recover'** or **'Rot'**. Food waste and garden waste can be processed at a high temperature and turned into compost. The waste can also be buried in **landfill** sites where the resulting methane gas from the rotting matter is collected and burned and used to generate heat or electricity in the same way.

Art Year 9 - Term 1 - Natural Forms

Formal Elements	Definition	Example	Keywords
Line	A mark that connects two or more points.	These can be straight, curved, short or long. Specific types of line include: outline (generally a black line that goes around an image) and continuous line (a line in which you do not take your pencil/pen of the page)	**Observational Drawing** Drawing something from real life in front of you. **Tints & Shades** Tint - Adding white to a colour to make it lighter. Shades - Adding black to a colour to make it darker. **Proportion** The size and relation of objects to one another. Using the grid-method is one way of helping you draw using accurate proportions. **Cropping** Removing the outer area of a picture, looks like the image has been zoomed into. **Still Life** A piece that depicts objects or something that is generally static (does not move). **Landscape** A piece that depicts a view of some sort e.g. mountains, the sea, fields, woodlands, buildings etc. **Abstraction** Does not attempt to focus on accurate representation of reality but focuses rather on shapes, colours and gestural marks. **Realism** Accurate representation of reality e.g. a chair looks like a chair. **Symmetry** Two sides of a design are the same.
Tone	The lightness or darkness or something.	For darker tones use a higher grade B pencil.	
Colour	Colour is what you see when light reflects off something.	Primary Colours - can't be made by mixing colours together (Red, Yellow & Blue) Secondary Colours - mix two primary colours together (Green, Orange & Purple) Tertiary Colours - mix a primary and secondary colour together (Blue + Green = Turquoise) Complementary Colours - Colours opposite each other on the colour wheel (Orange/ Blue, Green/Red and Purple/Yellow)	
Texture	How something looks or feels.	Visual Texture - implied sense of texture that the artist creates through the use of various artistic elements such as line , shading, and colour. Physical Texture - texture you can actually feel with your hand Adjectives to describe different textures - fluffy, rough, smooth, soft, bold, uneven, slimy, faint, chalky, tacky etc.	
Pattern	A symbol, shape or colour that repeats.	Man-made patterns are designed by humans, natural patterns are formed by nature. Patterns can be orderly, uniform, geometric, random or symmetrical.	
Shape & Form	Shape is 2D. Form is 3D.	2D shapes include rectangles, squares and triangles. Geometric shapes are angular and have straight lines. Organic shapes have curved lines. 3D shapes include cylinders, spheres and cubes.	

Key Artist	Key Artist	More Keywords
Name Georgia O'Keeffe **Technique/ Style** Zooms in very closely and creates abstract looking organic shapes. **Inspiration** Natural Landscape, especially flowers. **Materials used** Oil Paints	**Name** Yellena James **Inspiration** Combines abstract forms, colourful shapes and tangled lines often found in nature. **Materials used** Pens, inks, markers, and acrylics	**Clay** A stiff, sticky fine-grained earth that can be moulded when wet. **Kiln** a furnace or oven used to fire pottery Ceramic made of clay and permanently hardened by heat. **Glaze** a substance used to add colour, decorate or waterproof a piece of ceramic work. **Slip** Watered down clay which is used as a type of glue to stick one piece of clay to another. **Carving** A shape or pattern cut into a specific material. **Layering** Laying one material on top of another (building up) **Bisque Ware** Fired clay that is ready to be glazed. **Rolling Guides** Wood slats used when rolling clay to give it an even thickness. **Ceramics** Any artwork produced using clay.

Drama Y9 Physical Theatre

5 Key acting skills

Voice: This is how you use your voice in performance. You can change your voice using your; Tone, pitch, pace, emotion, volume, projection, dialogue, dialect, accent, intonation, whistling, SFX, interjection.

Facial Expression: They are used to show the audience how a character is feeling through; Eye contact, eye brows, straight, emotions, gritting teeth, tense, relaxed, wrinkled, creased, staring, twitching.

Posture: This can also be called body language. This is how a character/actor holds their body. For example; Bad posture would mean someone is hunched over.

Gestures: Gestures are movements that have a meaning. For example; if you wave at someone you would be saying hello to them. Gestures can be performed by; Hands, arms, speed, clicking, rubbing, waving, mannerisms.

Movement: This is any movement that does not have a meaning. For example; Walking. Speed, pace, acceleration, gait,

Physical Theatre

Physical Theatre is the a form of drama that emphasises storytelling through use of movement and physical expression.

It often integrates elements of dance and mime. In physical theatre a story or emotion is communicated with the body.

This does not mean that speech is not allowed, it just means the focus of the performance is the movement rather than the dialogue.

Often in physical theatre, objects are created with **bodies** and actors can become the set and props.

When creating physical theatre, performers will often go through something called the, 'Devising Process'. Devising involves the development of character, script, technical elements such as costume, lighting and sound.

When creating physical theatre you have to work as an **Ensemble**. This is a group of performers all working together in a performance for the best possible outcome.

Key Physical Theatre practitioners

Frantic Assembly

Frantic Assembly is a physical theatre company that started out in 1994 in Swansea Wales.

Frantic Assembly say that they, 'create thrilling, energetic and unforgettable theatre.'

They create non-naturalistic pieces through the use of movement and music, although they have always said that this should never take away from the storyline. They have created their own performances but have also adapted other famous plays such as, 'Othello.'

They use ensemble and contact work often in their pieces, and therefore believe in creating a trusting atmosphere when devising work.

Jacques Lecoq

He was a French theatre practitioner best known for his teaching methods in physical theatre, movement, and mime which he taught at the school he founded in Paris. He created a system for acting called, 'The seven states of tension'.

Example of how to self evaluate in Drama.

STRENGTH During my performance, I wanted to show how my character was really happy to see someone. To do this, I waved my hand violently and erratically to express how overjoyed I was at seeing the other character. I also had a very big smile and wide open eyes whilst making a high pitched noise to display my excitement. This was successful because the audience could clearly see how happy I was as my character was about to see his friend after a long time apart.

AREA FOR IMPROVEMENT During my performance, I wanted to show how my character was really happy to see someone. To do this, I slowly waved my hand and had a slight smile on my face whilst quietly saying 'Hello' in a soft tone. My intention was to show how I was happy but wanted to show it in a subtle way. However, the audience were confused by this and thought that my reaction was too small. If given the chance to perform this moment again, I would make my gestures much bigger, my movements quicker and my facial expressions much more exaggerated so that the audience can see my excitement much more clearly.

Frantic Assembly Techniques

Round-By-Through

This technique was created by Frantic Assembly and allows performers to create a sequence of moves. Performers will either move Round someone, By someone or Through someone.

Chair duets

This is another Frantic assembly technique. In pairs or small groups, performers will sit next to each other on chairs. Performers will then take it in turns to move a part or parts of their body. They can also move their partners body. Eventually the performers will have a sequence of moves which they can repeat over and over again without stopping.

Puppetry

In pairs or small groups one actor will become the puppet and the others will be the puppeteers. The puppeteers will then move the body parts of the puppet one at a time. This will create a performance of one or more characters controlling another character.

Frantic Assembly's Techniques

When using the techniques mentioned it is important to follow a system which has been created.

Firstly you need to create the moves. Before you know what the scene is going to be or who the characters are you have to just create the basic routine of movements.

Next you can add resistance to the movements. This means that you might add different levels of tension to your own movements, or if your partner is moving your arm them they might resist your movement more.

Thirdly you can change the speed at which you do the movements. Each movement can have a different speed at which it is done.

The penultimately element to add is eye contact. You have to find some moments where you can make eye contact with your partner.

Finally you can add any extras such as Lighting or sound.

Once you have done all of this you will be able to see a story and characters being created without needing to think about it.

Physical Theatre Techniques

Ensemble movement

This is a technique which started during Greek Theatre. Performers will work as a team to create one moving object or scene. An example of this is performers creating the object of a moving car.

Total Theatre

This is a style of theatre created by a practitioner called Steven Berkoff. His style of theatre is physical and exaggerated. It is completely non-naturalistic. Total theatre is where voice, movement, music, lighting all work together with equal importance to create performance. Actors will use their whole bodies to create physical objects such as a bed. The actors will have to physically create the whole object.

Mirroring

Actors will stand opposite each other and copy one another's moves exactly. The audience should not be able to tell who the leader of the pair is as the performers should be so in sync with one another.

How to create tension in performance.

Eye contact – Maintaining eye contact with the person you are in direct conflict with will increase the tension dramatically. It connects you to each other in a non physical way but still very personal.

Pauses – Arguably the most important of the three. Moments of silence are essential when building tension as not only do they show that each character is carefully weighing up their next move but it allows the audience to take some time to absorb the situation and keep them guessing what is going to happen next.

Volume and pace – speaking at a natural volume and pace lulls the audience into a false sense of security. By slowing decreasing both, the audience naturally begin to feel tension building. This can then be increased to a quicker pace and louder volume until the scene reaches a climax.

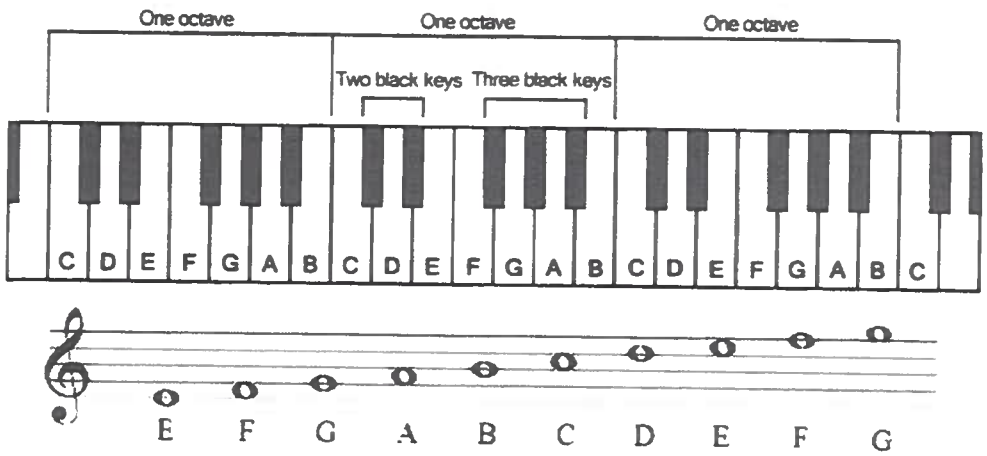
MUSIC - The Elements of Music

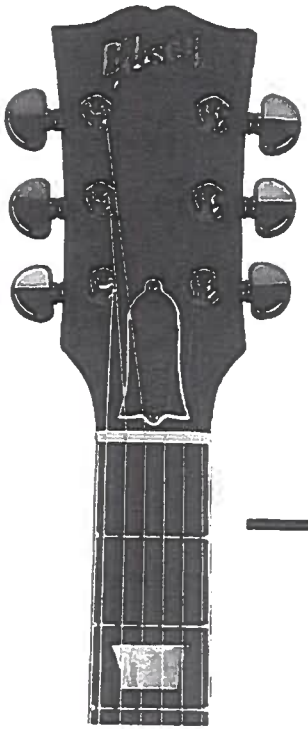
Key Terminology

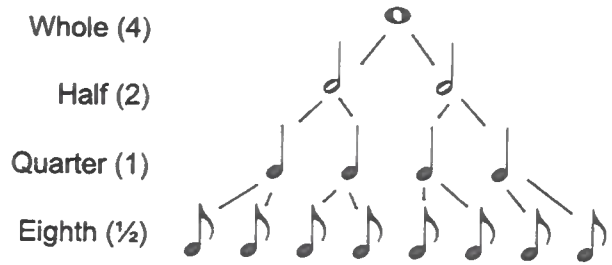
Conductor - A person who directs the performance.
Note - A singular sound.
Chord - A group of three or more notes played at the same time.
Harmony - Different notes played or sung together.
Melody - A small arrangement of notes that make a tune.
Scale - A series of eight notes starting somewhere between A-G.
Arpeggio - When you play the 1st, 3rd, 5th, and 8th note of a scale one after each other.
Rhythm - The pattern of how notes are played.
Beat - The pulse or heartbeat of the music.
Tempo - The speed of the music.
Dynamics - The volume of the music.
Octaves - The jump between the same note going higher or lower on the piano (e.g. lower C to higher C).
Pitch - How high or low the notes are played.
Guitar - 6-stringed instrument. Can be electric or acoustic.
Bass Guitar - Low sounding 4-stringed instrument. Usually electric.
Piano/Keyboard - Percussion instrument made up of white keys and black keys.
Drum Kit - Percussion instrument made up of drums and cymbals.

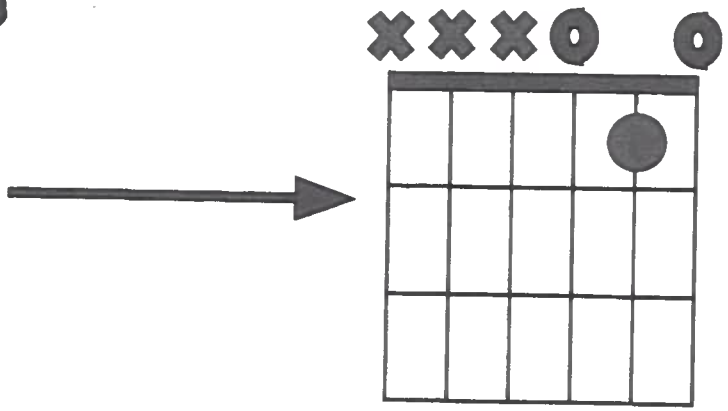
Feedback Starters

Positives: ***What I thought went well was...***
Points for improvement: ***It would be even better if...***









Year 9 PCSHE Topic 1 – Peer Influence and Gangs

Key Words:

- **Gangs**:a group of people that are committing illegal acts together.
- **Coercion**:the act of persuading someone to do something by using force or threats.
- **Identity**: being who or what a person is.
- **Peer Influence:** when you choose to do something that you wouldn't usually do because you want to feel accepted and valued by your friends.
- **Drug dealing:** an individual or group who sells illegal drugs.
- **Criminal responsibility: t**he age at which a child may be arrested, prosecuted, tried in a court of law.
- **Manipulation:** to influence or control someone to your advantage.:
- **Support Network:** the people in your life that you can trust and can help you to achieve your goals.
- **Exit Strategies:** a way to escape
- **Bullying:** Doing something that harms another person (physically, emotionally etc.):
- **Career prospects:** The chance of future success in a job.
- **Stop and Search:** a law that gives a police officer the power to stop and search an individual if they have 'reasonable grounds' to suspect someone could be carrying: illegal drugs, a weapon, stolen property, something that could be used to commit a crime.
- **Joint Enterprise**: a if a persons' presence, actions or knowledge lead to a murder or assault then they can be charged even if they didn't directly do anything.

KPI 1: What is a gang?

- A gang is usually considered to be a group of people who spend time in public places that:
  - See themselves (and are seen by others) as a noticeable group
  - Engage in criminal activity and violence
- The specific crimes and behaviours relevant to each individual gang will vary, however it is important to be aware of common trends in gang. Common features of gang membership:
  - Being engaged in criminal activity and violence, usually starting with petty crime and developing to selling drugs, stealing phones or stabbings.
  - Laying claims over specific territory, often a postcode or estate
  - Wearing an identifying feature, often an item of clothing worn in a particular way e.g., turned up trouser leg, bandana, a specific colour
  - Usually in constant conflict with other gangs and unable to enter another gang's territory
  - Gang activity is rapidly moving online; encrypted messaging services are used to organise criminal activity and communicate
- Gang membership is decreasing in age, with children as young as 11 recruited into gang life
- Young gang members (usually aged between 12-17) are often used to transport drugs through a network to sell in less well-policed areas, this is known as maintaining or crossing 'county lines.

KPI 2: Signs of someone being in a gang:

- Wearing gang symbols/clothes or tattoos
- Risk taking behaviours
- Mixing with well known gang members
- Members have a lot of money/expensive clothing without a clear source of income.
- Using nicknames

KPI 3: Reasons why people join gangs

- Sense of belonging and/or identity
- Protection
- Enjoying risk taking
- To get respect
- Looking for a glamorous lifestyle
- Expectation to join from friends

KPI 4: Laws around knife crime:

- Possession of a knife has a 5-year prison sentence, even if it is not used.
- You can be arrested, charged and sent to prison if someone you are with stabs another person.
- The police can stop and search someone if they have 'reasonable grounds' to suspect they are carrying illegal drugs, a weapon, stolen property, something which could be used to commit a crime.
- It is illegal to sell knives to anyone under 18.
- You can be charged with a crime if you are over the age of 10.

KPI5: Consequences of being in a gang:

- Being subject to threats, blackmail and violence
- Being exploited and forced to commit crimes
- Being arrested, including for crimes committed by the gang that they have not directly committed under the law of joint enterprise.
- Not being able to leave or cut off ties with the gang
- Having their safety or the safety of friends and family threatened.
- Risk of physical harm, rape and sexual abuse.
- Risk of emotional abuse.
- Risk of severe injury or being killed.
- Abusing drugs, alcohol and other substances.
- Long-term impact on education and employment options.

If you need further support...

Home/School Support: Friends, family members, teacher, tutor, Mr Ogden, Mrs Jones, Mrs Loveridge, Mrs Aston, Mr Hayward.

Reputable Organisations:

- A Better Medway: www.abettermedway.co.uk
- Medway Youth Service (Local advice and support): 01634 33228, youth.enquiries@medway.gov.uk
- Childline (Free confidential and emotional support for young people): 0800 1111 www.childline.org.uk
- Crimestoppers (Anonymous crime reporting service, independent of the police): 0800 555111 https://crimestoppers-uk.org/
- Fearless Site (providing non-judgmental information and advice about crime and criminality): https://www.fearless.org/en/give-info
- Victim Support (A charity working to support people who have been the victim of crime) 0808 16 89 111, www.victimsupport.org.uk
- Runaway helpline (A confidential support service for young people in conflict at home): Call or Text 116 000 www.runawayhelpline.org.uk/advice/gangs
- Young Minds (A charity offering support for the emotional health and wellbeing of young people) www.youngminds.org.uk

Year 9 PCSHE Topic 2 – The Justice System

Key Terms

- **Law:** a system of rules which a country uses to regulate the behaviour of its citizens.
- **Civil Law**: When there is a dispute between two people and is usually a personal matter, rather than a crime. E.g. divorce
- **Criminal Law**: When someone breaks a law. E.g. stealing
- **Barrister**: A type of lawyer that defends the person charged with a crime in court.
- **Jury**: is made up of 12 adults, who sit in a crown court and decide whether the accused person is innocent or guilty.
- **Judges**: a person who is in charge of a trial in a court and decide how a guilty person should be punished.
- **Magistrate's Court**: All trials starts in a Magistrate's court. A Magistrate can give out sentences but don't have the same power as a Judge so they only rule over minor offenses. More serious crimes get referred to a Crown court, in front of a Judge.
- **The Crown Prosecution Service**: They advise the police on whether they have enough evidence to prosecute someone. They prepare cases for the court and can decide what charge they think the accused should receive.
- **Probation Officer**: they supervise offenders in the community when they've been released from prison.
- **Bail**: an amount of money that a person who has been accused of a crime pays so that they can be released until their trial.
- **Custody**: being kept in prison, while waiting to go to court for trial.
- **Caution**: a spoken warning given by the police to someone who has broken the law
- **Reoffend**: To offend again
- **Joint Enterprise**: a if a persons' presence, actions or knowledge lead to a murder or assault then they can be charged even if they didn't directly do anything.

KPI1: Introduction to Laws

Our law comes from legislation (laws passed by parliament) Common law and EU law. England and Wales have the same legal system; Northern Ireland has a very similar system. Scotland has its own system of laws

Types of Law:

- Criminal law: A specific crime has been committed. Case between an offender and the government (acting for all citizens) These cases will go through the criminal justice system and could lead to a custodial sentence. Range in severity, not all 'serious' An Act of Parliament has been broken.
- Civil law: Disputes between individuals or group. Often linked to rights e.g. company law, adoption, consumer rights. A claimant can bring a case to civil court, normally to claim damages (to sue for money) Can still be 'serious' and involve very emotive issues.

Legal responsibilities:

- Many people in the UK take a role in the running of the legal system. You still have rights, even if you are an offender Citizens can be on a jury (compulsory) train to be a magistrate (to hear cases in courts in their community), become a special constable (trained volunteers who support police) or advise in a tribunal (as an expert) These roles offer great support to justice within the community.
- If you are arrested you must be told the reason for the arrest, can tell someone, able to get legal aid, offered medical help if needed, provided with a written notice about your rights and offered an interpreter. Human Rights must also be followed in prison (within reason e.g. liberty, democracy.

KPI2: Types of Court:

Criminal Courts

- Magistrates court: 95% of cases, less serious crimes e.g. theft. Led by trained magistrates, no jury can only give minimal penalties.
- Crown court: Serious cases e.g. murder. Led by judge, formal, jury decides on guilt.

Courts must consider mitigating factors. The Crown prosecution Service (CPS) advises the police on cases for possible prosecution. It reviews cases submitted by the police for prosecution and decides the charge in very serious or complex cases.

Civil Courts:

- A dispute between two individuals or groups that requires legal advice Disputes can be solved in civil courts, but also via tribunals (less formal courts) Ombudsmen (expert decision makers) Mediation (talking it through) these are often cheaper and quicker.
- Tribunals produce rulings that are legally binding; an expert judge takes the lead. Ombudsmen are independent and free of charge but can be slow. Mediation can lead to a legally binding agreement.

Youth Justice System:

- The part of the justice system that deals with young people (10- 17) The youth justice system aims to prevent youth crime.
- The UK recognise that YP who break the law should be treated differently.
- Sentences will often focus on rehabilitation.
- YP must have an appropriate adult with them before they are questioned.
- Youth Offending Teams will work with YP to support and educate.
- Youth courts (less formal) are used but very serious crimes can be passed to a crown court.

Office for national statistics:

- The organisation that collects data about what is happening in the UK (including crime).
- Most YP who commit crime have low literacy or difficult backgrounds. Rates of reoffending are high (especially with YP) Violent crime has fallen over the last 20 years
- There is a growing view that prisons need to focus more on rehabilitating prisoners.
- Questions what government are doing to address the root causes of crime (literacy, poor home life)
- Crime statistics can be misleading as certain crimes (e.g. rape) may be underreported