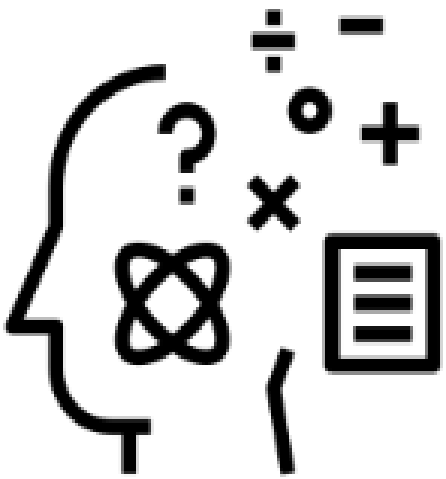
St Anne's
Church of England Academy

The best for everyone
The best from everyone
We have faith in our future

Year 11 Knowledge Organisers Term 2



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Hard Work Aspiration Integrity Respect

Cranmer Education Trust

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Knowledge Organisers at St. Anne's Academy

What is a Knowledge Organiser?

- A Knowledge Organiser is a tool which sets out exactly what knowledge is vital in the curriculum.
- It clarifies for everyone – pupil, parent and teacher– exactly what is being taught.
- It is not expected to cover the entirety of everything you may possibly cover in a topic – just what is vital.
- A Knowledge Organiser is a distillation of knowledge, not a textbook or step by step revision guide.

Benefits of Knowledge Organisers:

- For pupils they are a revision of ALL the key information the teacher has decided is necessary for the topic.
- Parents know what their children are learning and are able to get involved in supporting their revision through quizzing and testing at home.

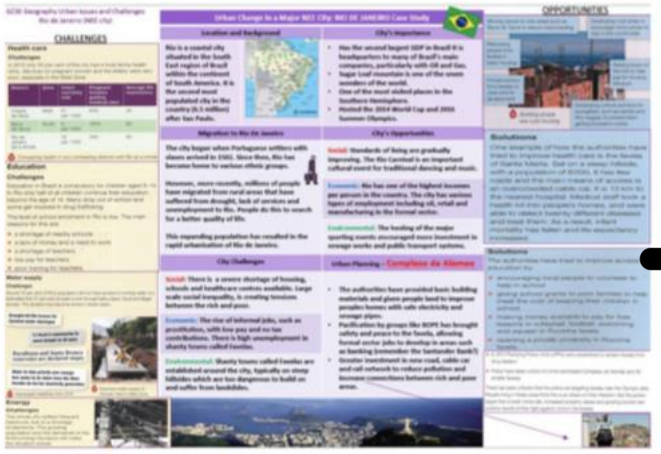
The purpose of knowledge organiser at St. Anne's is very clear. They will:

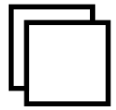
- Support pupils to retain the key knowledge learned in lessons;
- Enable parents to support their children in their learning;
- Promote independence in learning;
- Promote a work ethic which will support success in further education;
- Support wider reading and study to support curriculum learning;
- Encourage practice of examined tasks and questions.

A Guide for Students and Parents

For each topic being taught in each subject a Knowledge Organiser has been produced outlining the key important knowledge required to fully understand a topic.

- Students should set aside time each day/evening dedicated to each subject they study.
- Students should use the knowledge organisers for independent study using the following method.



Look 	Read the specific important knowledge you need to learn for each subject.
Say 	Read aloud the specific important knowledge you need to learn.
Cover 	Cover your knowledge organiser.
Write 	Write out everything you can remember from the specific part of the important knowledge you have been reading on a blank sheet of A4 paper.
Check 	Check that you have all the content needed and it is correct. Any content that is missing or incorrect use another colour pen to illustrate the gaps in your knowledge that you have corrected.
Repeat 	Fold you A4 sheet so that what you have just written is no longer visible. Repeat the steps above until you are 100% correct.

KS4 English Literature– Paper 1, Section A: Macbeth Knowledge Organiser

Language for Learning:

Ambition
Loyalty
Fate
Supernatural
Masculinity
Femininity
Tragedy
Stage directions
Soliloquy
Hamartia
Hubris
Prophecy
Paradox
Tragic hero

Language to describe the characters:

Macbeth: *ambitious, courageous, deceitful, impulsive, ruthless, treasonous, tyrannical*
Lady Macbeth: *cunning, dominant, emasculating, malevolent, mutinous, powerful, scheming, vulnerable*
Banquo: *devoted, intuitive, loyal, trustworthy, virtuous*
Duncan: *benevolent, faithful, honest, naïve, sincere*
Macduff: *devout, fervent, heroic, merciless, patriotic, unwavering*
Witches: *corrupt, ignoble, manipulative, sinister, subversive, prophetic.*

Act 1	1. The witches meet on the heath and plan to meet Macbeth. 2. Macbeth and Banquo have fought and won a battle. 3. The witches meet Macbeth and Banquo. They tell Macbeth he will become Thane of Cawdor and King. Macbeth becomes Thane of Cawdor and begins believing in what the witches told him. 4. Macbeth sends Lady Macbeth a letter informing her of the witches' prophecy. Lady Macbeth convinces Macbeth to kill King Duncan. 5. Duncan arrives at Macbeth's castle 6. Macbeth's soliloquy. Macbeth tells Lady Macbeth he will not murder Duncan. She convinces him to go ahead with the murder.	
Act 2	1. Banquo and Macbeth talk briefly about the witches. Macbeth hallucinates a dagger in front of him. 2. Macbeth murders King Duncan. Macbeth's guilt is apparent. Lady Macbeth feels no guilt. 3. Duncan's dead body is discovered. 4. Macbeth becomes king.	
Act 3	1. Macbeth questions Banquo. He plans his murder. 2. Macbeth and Lady Macbeth's relationship begins changing. 3. Banquo is murdered but his son Fleance escapes. 4. Macbeth celebrates becoming King with a banquet. He begins to hallucinate Banquo's ghost in front of all the guests. 5. We meet Hecate (in charge of the witches) 6. Lennox shares his suspicions about Macbeth.	
Act 4	1. Macbeth returns to visit the witches as he becomes increasingly paranoid. 2. The witches share three prophecies as well as sharing a vision of Banquo. 3. Macbeth has Macduff's wife and children murdered. 4. Malcolm puts Macduff to the test.	
Act 5	1. Lady Macbeth begins to feel guilty and starts sleepwalking. 2. Macbeth is fearless due to the prophecy of the witches. 3. Great Birnam wood rises 4. Lady Macbeth commits suicide 1. Malcolm prepares for battle 2. Macduff kills Macbeth and beheads him. 3. Malcolm (the son of Duncan) is crowned king.	

Key context

The Great Chain of Being	1. God is at the top of the Great Chain of Being 2. Kings were chosen by 'divine right.' God chose the king. 3. Males were above females. 4. People were expected to respect their position in the chain and, if they did so, would be rewarded in heaven.
King James I	1. King of Scotland from 1567 - 1625 2. King James was fascinated by the supernatural and wrote a book entitled 'Demonlogy' in 1597 3. King James's ancestor, Banquo, is made a hero in the play. 4. King James had survived an assassination attempt.
Witches and the supernatural	1. Christians believed witches to be the agents of Satan. 2. In 1604, it was a capital offence to be a witch. Association with a witch led to hanging, burning or drowning. 3. It was believed, witches could see into the future, change the weather and could call up the dead.
Role of women	1. Patriarchal society in which women were seen as inferior and had to be obedient to men. Lady Macbeth subverts this expectation.

KS4 English Literature– Paper 1, Section A: Macbeth Knowledge Organiser

Preparing you for GCSE Style Exam

Example exam question

Read this extract from Act 1:5 and then answer the question below
The following extract comes after Lady Macbeth has read Macbeth's letter about the witches prophecies

Lady Macbeth
The raven himself is hoarse
That croaks the fatal entrance of Duncan
Under my battlements. Come, you spirits
That tend on mortal thoughts, unsex me here,
And fill me from the crown to the toe top-full
Of direst cruelty. Make thick my blood.
Stop up the access and passage to remorse,
That no compunctious visitings of nature
Shake my fell purpose, nor keep peace between
The effect and it! Come to my woman's breasts,
And take my milk for gall, you murd'ring ministers,
Wherever in your sightless substances
You wait on nature's mischief. Come, thick night,
And pall thee in the dunnest smoke of hell,
That my keen knife see not the wound it makes,
Nor heaven peep through the blanket of the dark
To cry "Hold, hold!"

Starting with this speech, explore how Shakespeare presents ambition.

Write about
-How Shakespeare present ambition in the extract
-How Shakespeare presents ambition in the play as a whole

30 Marks
4 marks(A04)

You will always be given some information on where in the play the extract is from. Read this carefully.

Your question will be based on a key extract from the play. Use at least two quotations from here.

Read the question and highlight the keywords. You must refer to the rest of the play too.

Assessment objectives you are assessed on:
AO1- Your understanding of the text. This can be shown in your point/ topic sentence and the quotations you choose to support your point.
AO2- Language and structural analysis of key quotations.
AO3 – context (Jacobean era)
AO4- Spelling, punctuation and grammar.

Example response:

Through Macbeth, Shakespeare shows that being too ambitious can lead people to become morally corrupt. Shakespeare presents Lady Macbeth as being more ambitious than her husband and she is the one actually feeding Macbeth's ambition. Shakespeare shows how Lady Macbeth's desire for ambition leads her to become a evil manipulator. She commands the spirits to 'take [her] milk for gall.' Shakespeare uses the metaphor to highlight the extent of Lady Macbeth's ambition, as she is willing to get rid of her purity and femininity in exchange for poison. The noun 'milk' has connotations of innocence and femininity, which Lady Macbeth does not want to possess. Furthermore, the use of 'gall' emphasises her cruel and ruthless character. Through this portrayal of Lady Macbeth's ambitious character, Shakespeare shows that she subverts the expectation of a kind, nurturing and inferior Jacobean female.

Other example questions:

Starting with this speech, how does Shakespeare present violence?

Starting with this speech, how does Shakespeare present power?

Starting with this speech, how does Shakespeare present Macbeth as a hero?

Starting with this speech, how does Shakespeare present Lady Macbeth as powerful?

Starting with this speech, how does Shakespeare present evil?

You could be asked about the following key themes:

- Ambition
- Violence
- Power
- Good and Evil
- Masculinity and femininity
- Kingship
- Guilt
- Appearance and reality
- Supernatural

Or the following key characters:
Macbeth- Thane of Glamis, then Cawdor then King of Scotland.
Lady Macbeth – wife of Macbeth. Ambitious and manipulative.
Banquo- Macbeth's friend. Loyal and noble. Murdered by Macbeth
Macduff – Thane of Fife. Loyal to the king. Kills Macbeth.
King Duncan – King at the start of the play. Murdered by Macbeth
Witches – Tell Macbeth that he will be king. Tell Banquo his sons will be kings. Tell Macbeth to be aware of Macduff.

Year 11 Maths Foundation- Index Laws and Standard Form

Language for Learning

Indices
Standard Form
Negative
Reciprocal
Surd
Power
Root
Scientific notation

Index Laws

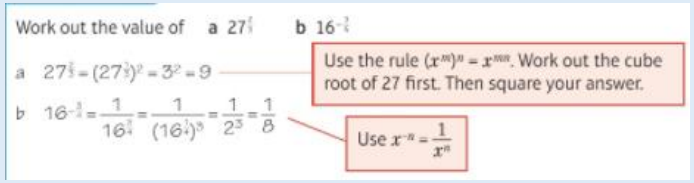
$$x^a \times x^b = x^{a+b}$$

$$x^a \div x^b = x^{a-b}$$

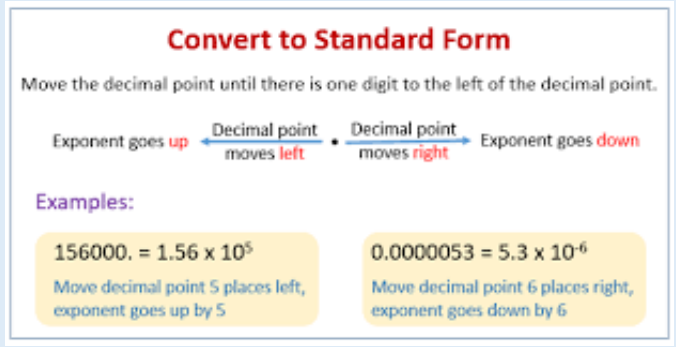
$$(x^a)^b = x^{ab}$$

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

$$x^{\frac{a}{b}} = (\sqrt[b]{x})^a$$



Standard Form



Standard form or scientific notation, is a general way of expressing very large or very small numbers.

Calculations with Standard Form (without calculator)

Multiply	Divide
$(4 \times 10^6) \times (2 \times 10^3)$ $= 8 \times 10^9$	$(4 \times 10^6) \div (2 \times 10^3)$ $= 2 \times 10^3$
$(3 \times 10^6) \times (2 \times 10^{-2})$ $= 6 \times 10^4$	$(4.8 \times 10^6) \div (1.2 \times 10^3)$ $= 4 \times$
$(4 \times 10^6) \times (3 \times 10^3)$ $= 12 \times 10^9$ ✓ $= 1.2 \times 10^{10}$ ✓	$(1 \times 10^6) \div (2 \times 10^3)$
$(5 \times 10^6) \times (7 \times 10^3)$	$(1 \times 10^7) \div (4 \times 10^5)$

Year 11 Higher Maths - More Algebra and Surds

Language for Learning

Algebraic Fraction
Cancelling
Numerator
Denominator
Composite Function
Inverse Function
Surd
Rationalize
Irrationality
Proof
Consecutive

Algebraic Fractions

Simplifying Algebraic Fractions

You may need to factorise before simplifying Algebraic Fractions.

1. Factorise the numerator and denominator
2. Cancel any common factors

Example

$$\frac{(x+2)(x-1)}{(x-1)(x-5)} = \frac{x+2}{x-5}$$

Non Example

Here we cannot cancel the x terms because they are not "factors"

$$\frac{x+2}{x-5} \neq \frac{2}{5}$$

Four Operations with Algebraic Fractions

When adding/subtracting/multiplying or dividing algebraic fractions we apply the same rules as when we are performing the four operations with regular fractions.

Example

Write $\frac{7}{x+2} - \frac{3}{x+3}$ as a single fraction in its simplest form.

Common denominator $= (x+2)(x+3)$ — Find a common denominator.

$$\frac{7(x+3)}{(x+2)(x+3)} - \frac{3(x+2)}{(x+2)(x+3)}$$ — Convert each fraction to an equivalent fraction with the common denominator $(x+2)(x+3)$.

$$= \frac{7(x+3) - 3(x+2)}{(x+2)(x+3)}$$ — Subtract the fractions.

$$= \frac{7x+21-3x-6}{(x+2)(x+3)} = \frac{4x+15}{(x+2)(x+3)}$$ — Expand the brackets in the numerator, then simplify.

Surds

REMINDER:
A surd is a number written exactly using square roots or cube roots.

It is a simpler way of writing **irrational numbers.**

Rational numbers can be written as a fraction in the form $\frac{a}{b}$, where a and b are integers and $b \neq 0$.
2 is rational as it can be written as $\frac{2}{1}$.
$0.\dot{2}$ is rational as it can be written as $\frac{2}{9}$.
$\sqrt{2}$ is irrational.

To rationalise the fraction $\frac{1}{a\sqrt{b}}$, multiply by $\frac{\sqrt{b}}{\sqrt{b}}$

To rationalise the fraction $\frac{1}{a \mp \sqrt{b}}$, multiply by $\frac{a \pm \sqrt{b}}{a \pm \sqrt{b}}$

Functions

A **function** is a rule for working out values of y for given values of x. For example $y = 3x$ and $y = x^2$ are functions

The notation $f(x)$ is read as "f of x". f is the function. $f(x) = 3x$ means the function of x is $3x$.

Example: $f(x) = 10x + 2$

a. f(5) = 52
We have worked out the function when x=5

b. $f(0.5) = 7$
We have worked out the function for x=0.5

fg is a **composite function**.
To work out $fg(x)$, first work out $g(x)$ and the substitute your answer into $f(x)$.

$\mathbf{f^{-1}(x)}$ is the **inverse function** of x

Algebraic Proof

A Proof is a logical argument for a mathematical statement. To prove a statement is true, you must show that it is true in all cases.

Even number	$2n$
Odd number	$2n+1$ or $2n-1$
Consecutive numbers	$n, n+1, n+2, \ldots$
Consecutive even numbers	$2n, 2n+2, 2n+4, \ldots$
Consecutive odd numbers	$2n+1, 2n+3, 2n+5, \ldots$

Example: Prove that the **sum of two odd numbers** is always **even**
$(2n + 1) + (2n + 3) \equiv 4n + 4$
which must be even since 2(2n+2) is a multiple of 2.

KS4 Chemistry, Paper 4, Topic 8 Fuels and Combustion

Language for Learning:

Acid rain
Alkane
Alkene: A hydrocarbon in which there are one or more double bonds between carbon atoms.
Atmosphere The layer of gases that surrounds the Earth.
Complete combustion
Cracking
Finite resources
Fraction
Greenhouse effect: The 'trapping' of warmth by greenhouse gases in the Earth's atmosphere due to radiation from the atmosphere warming the surface of the planet.
Homologous series
Hydrocarbon
Incomplete combustion
Non-renewable
Pollutant: A substance that harms living organisms when released into the environment.
Saturated: A molecule that contains only single bonds between the carbon atoms in a chain.
Soot
Structural formula: A diagram showing information about the positions of the atoms in a molecule and the bonds between them.
Unsaturated: A molecule that contains one or more double bonds between carbon atoms in a chain.
Viscosity: How thick or runny a liquid is. Low viscosity is very runny, high viscosity is thick.

Hydrocarbons

Hydrocarbons are compounds which contain the elements hydrogen and carbon only.
Crude oil is a mixture of many different hydrocarbon compounds, but it is not useful on its own.
Crude oil is finite - not being made any more (or made very slowly).
Non renewable - it is being used up faster than it is being formed.

Alkanes

Alkanes are the simplest group of hydrocarbons.
Carbon can form 4 bonds. Hydrogen can form 1 bond.
As you increase the number of carbon atoms in the alkane the boiling point gets higher. Bigger molecules have stronger intermolecular forces which need more heat energy to overcome.
The alkanes are a homologous series

- They have the same general formula C_nH_{2n+2}
- They increase by CH_2 each time
- They have similar chemical reactions
- They show trends in physical properties

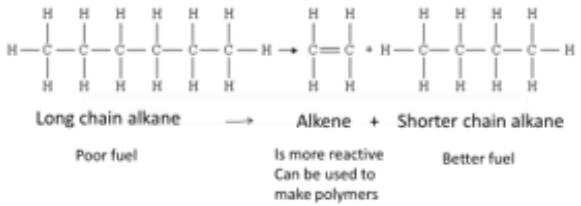
Fractional distillation

The hydrocarbons in crude oil are separated into fractions according to their boiling point. To do this, crude oil is heated up and passed into a column which has a temperature gradient – hot at the bottom cold at the top
Hydrocarbons form covalently bonded molecules. As the molecules get bigger the intermolecular forces holding them together get stronger and they have higher boiling points.

Cracking

Crude oil is a natural product and contains fixed amounts of different fractions. This causes oil companies problems as longer chain alkanes don't make as good fuels and their supply outstrips their demand.

To overcome this problem oil companies turn long chain alkanes into short chain alkanes and alkenes using cracking.
Cracking is a thermal decomposition reaction and needs a catalyst. You need to be able to complete symbol and picture equations for cracking

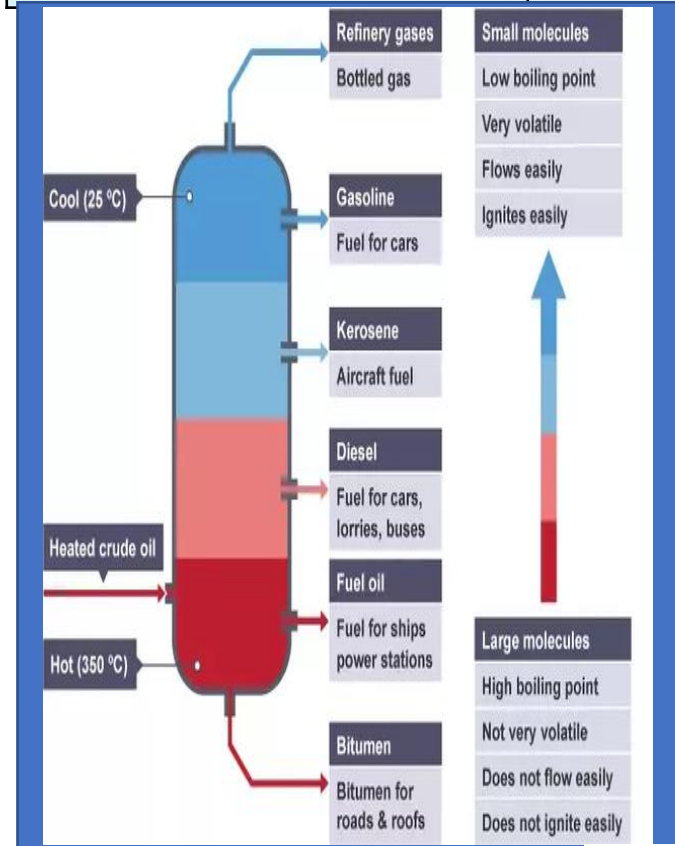


Combustion

Complete combustion
If there is plenty of oxygen, hydrocarbon fuels burn completely in oxygen to give carbon dioxide and water only e.g.
$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2$
Complete combustion is a problem because it produces carbon dioxide which is a greenhouse gas and causes global warming.
Incomplete combustion
If there is not enough of oxygen, hydrocarbon fuels burn incompletely in oxygen to give carbon monoxide, soot and water e.g.
$C_2H_6 + O_2 \rightarrow CO + C + H_2O$
Carbon monoxide acts like oxygen and binds to haemoglobin in the blood, stops you getting oxygen and suffocates you. Soot causes building to turn black and breathing problems.
Global warming: Heat energy gets trapped by the atmosphere, increasing the average temperature of the Earth.
Gases involved: greenhouse gases – mostly carbon dioxide formed from combustion of fossil fuels
Acid rain: rain with a pH of less than 6.5
Gases involved: carbon dioxide, sulphur dioxide, nitrogen oxides. Carbon dioxide is a direct product of combustion.
Sulphur is an impurity in fossil fuels. When fossil fuels are burnt the sulphur burns to make sulphur dioxide
Sulphur dioxide is an acidic gas which dissolves in water to make sulphuric acid. Oxides of nitrogen (NO_x) are formed when oxygen and nitrogen from the air are combined inside engines at high temperature.

8.1	Recall that hydrocarbons are compounds that contain carbon and hydrogen only
8.2	Describe crude oil as: a) a complex mixture of hydrocarbons b) containing molecules in which carbon atoms are in chains or rings (names, formulae and structures of specific ring molecules not required) c) an important source of useful substances (fuels and feedstock for the petrochemical industry) d) a finite resource
8.3	Describe and explain the separation of crude oil into simpler, more useful mixtures by the process of fractional distillation
8.4	Recall the names and uses of the following fractions: a) gases, used in domestic heating and cooking b) petrol, used as fuel for cars c) kerosene, used as fuel for aircraft d) diesel oil, used as fuel for some cars and trains e) fuel oil, used as fuel for large ships and in some power stations f) bitumen, used to surface roads and roofs
8.5	Explain how hydrocarbons in different fractions differ from each other in: a) the number of carbon and hydrogen atoms their molecules contain b) boiling points c) ease of ignition d) viscosity and are mostly members of the alkane homologous series
8.6	Explain an homologous series as a series of compounds which: a) have the same general formula b) differ by CH_2 in molecular formulae from neighbouring compounds c) show a gradual variation in physical properties, as exemplified by their boiling points d) have similar chemical properties
8.7	Describe the complete combustion of hydrocarbon fuels as a reaction in which: a carbon dioxide and water are produced b energy is given out
8.8	Explain why the incomplete combustion of hydrocarbons can produce carbon and carbon monoxide
8.9	Explain how carbon monoxide behaves as a toxic gas
8.10	Describe the problems caused by incomplete combustion producing carbon monoxide and soot in appliances that use carbon compounds as fuels
8.11	Explain how impurities in some hydrocarbon fuels result in the production of sulphur dioxide
8.12	Explain some problems associated with acid rain caused when sulfur dioxide dissolves in rain water
8.13	Explain why, when fuels are burned in engines, oxygen and nitrogen can react together at high temperatures to produce oxides of nitrogen, which are pollutants
8.14	Evaluate the advantages and disadvantages of using hydrogen, rather than petrol, as a fuel in cars
8.15	Recall that petrol, kerosene and diesel oil are non-renewable fossil fuels obtained from crude oil and methane is a non-renewable fossil fuel found in natural gas
8.16	Explain how cracking involves the breaking down of larger, saturated hydrocarbon molecules (alkanes) into smaller, more useful ones, some of which are unsaturated (alkenes)
8.17	Explain why cracking is necessary
8.18	Recall that the gases produced by volcanic activity formed the Earth's early atmosphere
8.19	Describe that the Earth's early atmosphere was thought to contain: a) little or no oxygen b) a large amount of carbon dioxide c) water vapour d small amounts of other gases and interpret evidence relating to this
8.20	Explain how condensation of water vapour formed oceans
8.21	Explain how the amount of carbon dioxide in the atmosphere was decreased when carbon dioxide dissolved as the oceans formed
8.22	Explain how the growth of primitive plants used carbon dioxide and released oxygen by photosynthesis and consequently the amount of oxygen in the atmosphere gradually increased
8.23	Describe the chemical test for oxygen
8.24	Describe how various gases in the atmosphere, including carbon dioxide, methane and water vapour, absorb heat radiated from the Earth, subsequently releasing energy which keeps the Earth warm: this is known as the greenhouse effect
8.25	Evaluate the evidence for human activity causing climate change, considering: a) the correlation between the change in atmospheric carbon dioxide concentration, the consumption of fossil fuels and temperature change b) the uncertainties caused by the location where these measurements are taken and historical accuracy
8.26	Describe: a) the composition of today's atmosphere b) the potential effects on the climate of increased levels of carbon dioxide and methane generated by human activity, including burning fossil fuels and livestock farming c) that these effects may be mitigated: consider scale, risk and environmental implications

Seneca Assignments	Score (%)
8.1.1 Crude Oil	
8.1.2 Fractions	
8.1.3 Hydrocarbons	
8.1.4 Hydrocarbons 2	
8.2.1 Earth's early atmosphere	
8.2.2 Test for oxygen	
8.2.3 Global warming	
8.2.4 Global warming 2	
8.2.5 End of topic test	
8.2.6 Grade 9 – Fuels & Earth Science	



KS4 Chemistry, Paper 4, Topic 8 Part 2 Atmospheric Chemistry

Language for Learning:

Atmosphere - The layer of gases that surrounds the Earth.

Complete combustion
- Combustion of hydrocarbons with enough oxygen present to convert all the fuel into carbon dioxide and water.

Greenhouse effect - The 'trapping' of warmth by greenhouse gases in the Earth's atmosphere due to radiation from the atmosphere warming the surface of the planet.

Greenhouse gas - A gas that helps to trap 'heat' in the atmosphere. Carbon dioxide, methane and water vapour are greenhouse gases.

Pollutant - A substance that harms living organisms when released into the environment.

Soot - A form of carbon, which is produced as very fine particles when hydrocarbon fuels undergo incomplete combustion.

Early Atmosphere

The Earth is about 4.5 billion years old.

The early crust of the Earth was thin and there were lots of volcanoes.
Volcanoes released the gases in the early atmosphere:

Lots of carbon dioxide and water vapour.

Small amounts of ammonia, nitrogen and methane.

As the Earth cooled the water vapour in the atmosphere condensed to form the oceans.

Evidence of early atmosphere

Analysis of the gases produced from current volcanoes.

Observations of other volcanic planets such as Mars and Venus show they have a lot of carbon dioxide in their atmosphere.

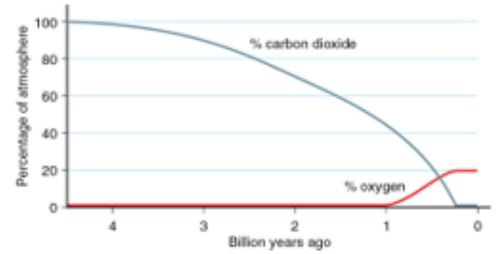
Early rocks did not contain iron oxide which suggests that there was no oxygen in the early atmosphere. As the amount of oxygen in the atmosphere increased, the amount of iron oxide in rocks increased.

Changing Atmosphere

Over the next 4 billion years the amount of carbon dioxide in the atmosphere decreased.

It dissolved into the oceans.

It turned into the shells of sea-creatures and then into rocks (mostly as carbonates).



Atmosphere today

The atmosphere today consists of about 21% oxygen, 79% nitrogen and 1% argon.

Today the amount of carbon dioxide in the atmosphere is very small (0.05 %). However, it is increasing due to human activity. Mostly burning fossil fuels

Over millions of years carbon dioxide was:

Dissolved in oceans.

Used by sea creatures in shells (calcium carbonate) - now in rocks.

Used by plants for photosynthesis – now in fossil fuels.

Burning fossil fuels releases carbon back into the atmosphere as carbon dioxide

Climate Change

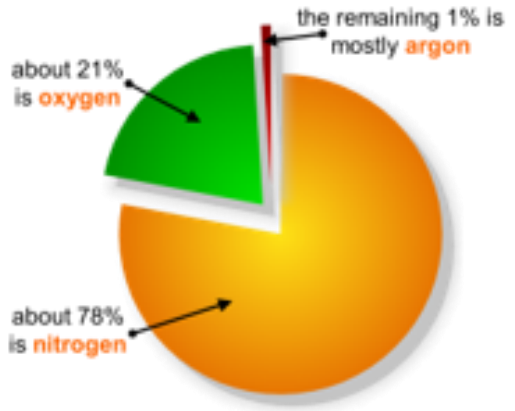
The two main greenhouse gases are carbon dioxide and methane. There are different human activities that release these gases into the atmosphere

Carbon dioxide (CO_2)	Methane (CH_4)
• Burning fossil fuels -transport -heating -producing electricity	• Released when drilling for fossil fuels • Livestock farming • Landfill sites • 'paddy' fields

There is a direct correlation between the temperature of the Earth and the amount of carbon dioxide in the atmosphere.

The effects of climate change include:
- Ice caps and glaciers melt causing rising sea levels
- Change of habitats – some animals may become extinct.
- Climate change, some areas drier, some wetter. More extreme weather events.
- Ocean temperatures rise and effect organisms e.g. coral

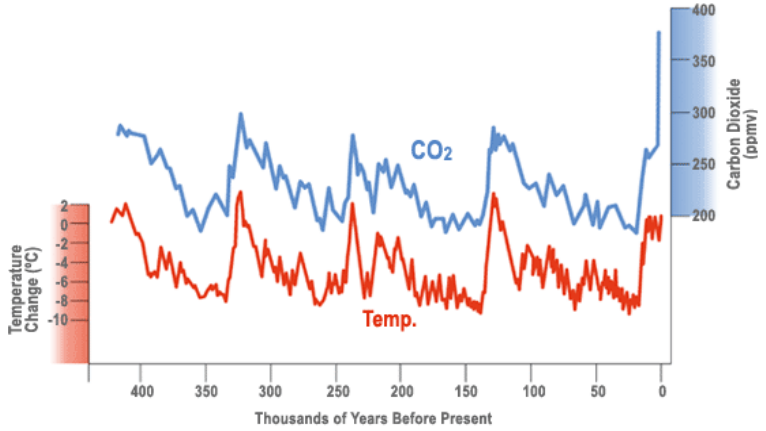
The earliest organisms to use photosynthesis were bacteria. These reduced the amount of carbon dioxide and increased the amount of oxygen in the atmosphere.
When land plants evolved the amount of oxygen in the atmosphere rapidly increased.



KS4 Chemistry, Paper 4, Topic 8.2 Atmospheric Chemistry

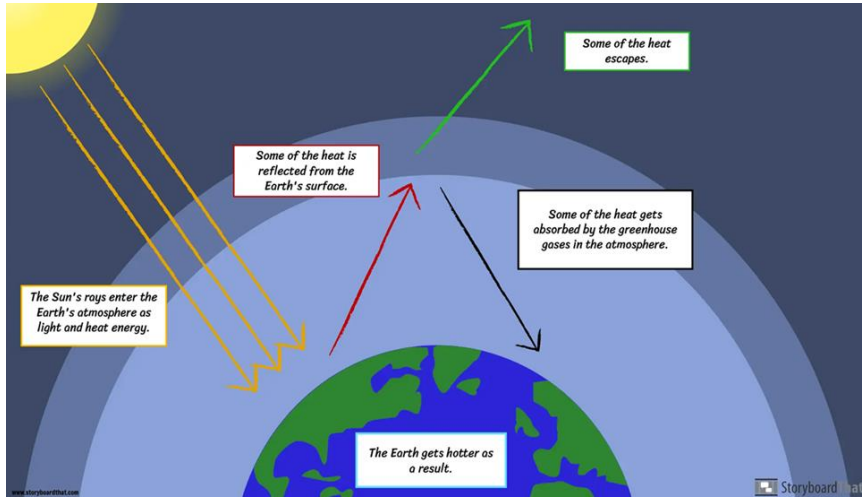
Correlation and causation

Just because two things are correlated does not mean that one caused the other to change. However, there is now lots of evidence that supports the fact that human activity has caused the climate to change.



The greenhouse effect

Carbon dioxide, methane and water vapour are the main greenhouse gases. They trap heat in the atmosphere in an effect known as the greenhouse effect.



8.18	Recall that the gases produced by volcanic activity formed the Earth's early atmosphere			
8.19	Describe that the Earth's early atmosphere was thought to contain: a) little or no oxygen b) a large amount of carbon dioxide c) water vapour d small amounts of other gases and interpret evidence relating to this			
8.20	Explain how the condensation of water vapour formed oceans			
8.21	Explain how the amount of carbon dioxide in the atmosphere was decreased when carbon dioxide dissolved as the oceans formed			
8.22	Explain how the growth of primitive plants used carbon dioxide and released oxygen by photosynthesis and consequently the amount of oxygen in the atmosphere gradually increased			
8.23	Describe the chemical test for oxygen			
8.24	Describe the greenhouse effect			
8.25	Evaluate the evidence for human activity causing climate change			
8.26	Describe: a) the composition of today's atmosphere b) the potential effects on the climate of increased levels of carbon dioxide and methane generated by human activity, including burning fossil fuels and livestock farming c) that these effects may be mitigated: consider scale, risk and environmental implications			

Gas	Gas test
Hydrogen (H_2)	Add a lighted splint and makes a squeaky pop
Oxygen (O_2)	Add a glowing splint which will relight
Carbondioxide (CO_2)	Bubble through limewater which will go milky
Chlorine (Cl_2)	Pass over damp blue litmus paper which will turn red and then bleach white.

Seneca Assignments	Score (%)
8.2.1 Earth's early atmosphere	
8.2.2 Test for oxygen	
8.2.3 Global warming	
8.2.4 Global warming 2	
8.2.5 End of topic test	
8.2.6 Grade 9 – Fuels & Earth Science	

Language for Learning:

Addition polymerisation	A type of polymerisation in which the monomers add on to each other and no small molecules are eliminated.
Addition reaction	A reaction in which reactants combine to form one larger product molecule and no other products.
Alcohols	An homologous series of compounds that contain the –OH functional group.
Biodegradable	A substance that can be broken down by microorganisms.
Carboxylic acids	An homologous series of compounds that contain the –COOH functional group.
Condensation polymerisation	A reaction in which monomers join together to form a polymer and eliminate a small molecule, such as water.
Distillate	The liquid produced by condensing gases during distillation.
Ester link	This link is present in all polyester molecules. It consists of –COO–.
Fermentation	Anaerobic respiration occurring in microorganisms.
Functional group	An atom or group of atoms that are mainly responsible for a molecule's chemical properties.
General formula	The formula showing the proportions of different atoms in molecules of a homologous series. For example, alkenes have the general formula C*n*H2*n*.
Isomers	Molecules with the same molecular formula but different arrangements of atoms.
Monomer	A small molecule used to make a polymer.
Organic compound	A compound that has a central framework of carbon atoms onto which hydrogen and other atoms are attached. Methane (CH4) is organic but carbon dioxide is not (because it contains no hydrogen atoms).
Oxidising agent	A substance that causes another substance to be oxidised in an oxidation reaction.
Polyester	This is a polymer that contains large numbers of ester links.
Polymer	A long-chain molecule made by joining many smaller molecules (monomers) together.
Polymerisation	A reaction in which a large number of small molecules (monomers) join together to form a long chain molecule (polymer).
Repeating unit	The part of a polymer that can be repeated many times to form the polymer chain.

Hydrocarbons and Polymers

Hydrocarbons are molecular compounds that contain only carbon and hydrogen.

Alkanes

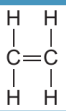
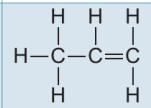
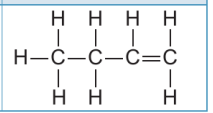
General formula: **CnH2n+2**

Number of carbons in the chain	Prefix	Alkane	Molecular formula	Structural formula
1	meth-	methane	CH_4	
2	eth-	ethane	C_2H_6	
3	prop-	propane	C_3H_8	
4	but-	butane	C_4H_{10}	

The lines in structural formulae represent covalent bonds. Molecules are **saturated** if all carbon-carbon covalent bonds are single bonds.

Alkenes

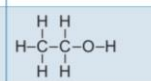
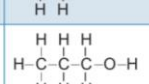
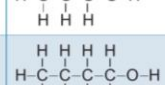
General formula: **CnH2n**

Name	Molecular formula	Structural formula
ethene	C_2H_4	
propene	C_3H_6	
butene	C_4H_8	

The Carbon-Carbon double bond (C=C) is known as a functional group. This double bond makes Alkenes **unsaturated.**

Alcohols

General formula: **CnH2n+1OH**

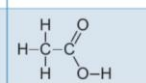
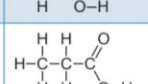
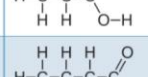
Name	Molecular formula	Structural formula
methanol	CH_3OH	
ethanol	C_2H_5OH	
propanol	C_3H_7OH	
butanol	C_4H_9OH	

-OH functional group

Alcohols can be oxidised to form carboxylic acids. They react with reactive metals forming hydrogen. Reactivity depends on carbon chain length.

Carboxylic acids

General formula: **CnH2n+1COOH**

Name	Molecular formula	Structural formula
methanoic acid	HCOOH	
ethanoic acid	CH_3COOH	
propanoic acid	C_2H_5COOH	
butanoic acid	C_3H_7COOH	

-COOH functional group.
Formed by the gentle oxidation of alcohols using oxidising agents such as hot copper oxide.

Combustion

When hydrocarbons burn and enough oxygen is present, they form carbon dioxide and water. This is an **Oxidation** reaction. If there is insufficient oxygen, full oxidation does not take place and carbon (soot) and carbon monoxide can be formed as well. This is called incomplete combustion.

Polymers

Long chains made up of repeating units called monomers. Polymers have different uses depending on their properties.

Polymer	poly(ethene)	poly(propene)
Common name	polythene	polypropylene
Properties	flexible, cheap, good insulator	flexible, does not shatter
Uses	plastic bags, plastic bottles, cling film, polytunnels	buckets and bowls, crates, ropes, carpets

It is difficult to recycle polymers due to the many steps needed to obtain a new item. These include: collecting the waste, sorting, disposal of non-recyclable, clean and grind into chippings, purify chipping, melt and process into new item.

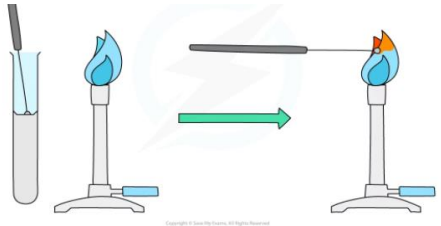
symbol	polymer	uses
1 PET	poly(ethylene terephthalate)	some bottles, food trays, duvet fillings

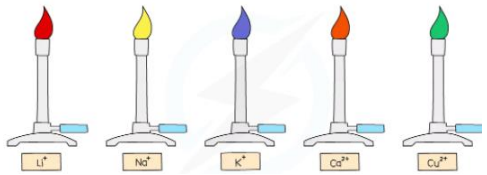
Example of polymer recycling symbol.

Qualitative Chemistry

Tests for positive ions

Metal ions produce a **colour** if heated strongly in a flame
Ions from **different** metals produce **different colours**





Metal cations in aqueous solution can be identified by the **colour** of the precipitate they form on addition of **sodium hydroxide**

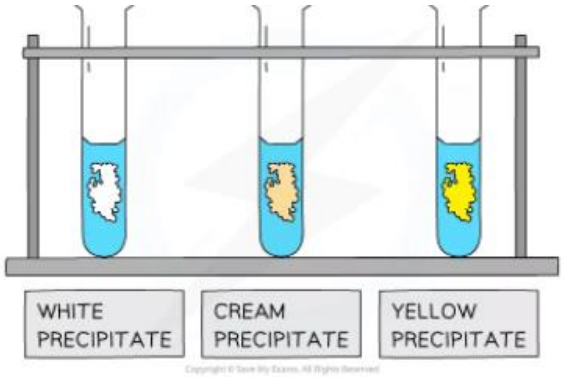
Metal Cation	Effect of adding NaOH
Aluminium (Al^{3+})	White precipitate, dissolves in excess NaOH to form a colourless solution
Calcium (Ca^{2+})	White precipitate, insoluble so remains in excess NaOH
Copper (II) (Cu^{2+})	Light blue precipitate, insoluble in excess
Iron (II) (Fe^{2+})	Green precipitate, insoluble in excess
Iron (III) (Fe^{3+})	Red–brown precipitate, insoluble in excess

Tests for negative ions

Carbonate Ion
•Add dilute acid and test the gas released.
•Effervescence should be seen and the gas produced is CO_2 which forms a **white** precipitate of calcium carbonate when bubbled through limewater

Sulphate Ion
•Acidify with dilute hydrochloric acid and add aqueous barium chloride.
•A **white** precipitate of barium sulphate is formed

Halide Ions
•Acidify with dilute nitric acid (HNO_3) followed by the addition of silver nitrate solution ($AgNO_3$).
•This forms a silver halide precipitate:
•Depending on the halide present, a **different coloured precipitate** is formed, allowing for identification of the halide ion
•Silver chloride is **white**, silver bromide is **cream** and silver iodide is **yellow**



Nanoparticles

Nanoparticles are structures, 1-100 nanometres (nm) in size, that usually contain only a few hundred **atoms**. This means that nanoparticles are around 100 times larger than atoms and simple **molecules**.

They have very large surface area to volume ratios. The properties of nanoparticulate substances are different from those of the same substance in bulk.

Properties and uses
Small sizes
Nanoparticulate materials are used in some paints, cosmetics and sunscreens. Sunscreens block harmful **ultraviolet light** from the sun reaching the skin. Titanium dioxide blocks ultraviolet light, so it is used in sunscreens. In bulk titanium dioxide is white – it is used as a pigment in white paint. However, nanoparticulate titanium dioxide has no colour and cannot be seen when it is spread on the skin. Many people prefer nanoparticulate sunscreen because it is not obvious that they are wearing it.
The large surface area to volume ratios of nanoparticulate substances allows them to act as **catalysts.**
Possible risks of nanoparticles
The small size of nanoparticles makes it possible to breathe them in, or for them to pass into cells. Once inside the body, they might catalyse reactions that are harmful. **Toxic** substances could bind to them, harming health if the nanoparticles do get into the body.

Materials

Materials include glass and clay ceramics, polymers, metals and composite materials. They have different physical properties, which make them suitable for different uses

Glass is **transparent** and **hard**, but it is **brittle**. Clay ceramics include brick, china and porcelain.

Metals are **malleable** and **ductile**, so they can be bent into shape or made into wires without shattering. Unlike glass and clay ceramics, metals are good electrical **conductors**.

Polymers are poor conductors of electricity and heat, but their other properties vary depending upon the particular polymer.

A **composite material** consists of two or more **materials** with different **properties**. They are combined to produce a material with improved properties. The table below shows some examples of composites.

Material
Reinforced concrete
Fibreglass
Carbon fibre reinforced polymer
Chipboard

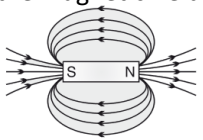
KS4 Physics, Paper 6, Topic 11 Magnetism and Electromagnets Knowledge Organiser

Bold text = higher content
Highlighted text = Triple Physics content

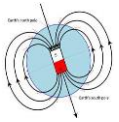
Language for Learning:

Alternator – A generator that produces alternating current.
Carbon brush – A block of carbon that makes electrical contact between a circuit and a moving object such as a slip ring or commutator.
Commutator – A device attached to the rotating coil of a generator that makes electrical contact with an external circuit. A commutator switches over the connections every half-turn of the coil so the output is a form of direct current.
Diaphragm – A thin sheet of flexible material.
Dynamo – rotating coils in a magnetic field which produce an electric current
Electromagnet – a magnet made using a coil of wire with electricity flowing through it
Electromagnetic induction – a process that creates a current in a wire when the wire is moved relative to a magnetic field, or when the magnetic field around it changes
Generator – A machine that produces electricity by rotating coils of wire in a magnetic field.
Induced/Temporary Magnet – a piece of material that becomes a magnet because it is in the magnetic field of another magnet
Magnetic Field – the area around a magnet where it can affect magnetic materials or induce a current
Magnetic Flux Density – a way of describing the strength of a magnetic field. It is measured in tesla (T)
Magnetic Material – a material, such as iron, that is attracted to a magnet
Motor Effect – the force experienced by a wire carrying a current that is placed in a magnetic field
National Grid – the system of wires and transformers that distributes electricity around the country
Permanent Magnet – a magnet that is always magnetic such as a bar magnet
Plotting Compass – a small compass used to find the shape of a magnetic field.
Slip ring – Metal rings connected to the rotation coil in a generator. They make electrical contact with an external unit.
Solenoid – a coil of wire with electricity flowing in it. Also called an electromagnet.
Step-down transformer – A transformer that reduces the voltage.
Step-Up transformer – A transformer that increases the voltage.
Tesla (T) – the unit for magnetic flux density, also given as Newtons per ampere meter (N/Am)
Transmission lines – The wires (overhead or underground) that take electricity from power stations to towns and cities

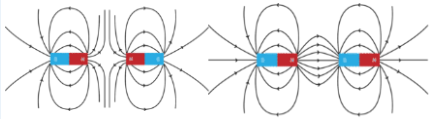
Magnetic field around a bar magnet. The closer the field lines, the stronger the magnetic field.



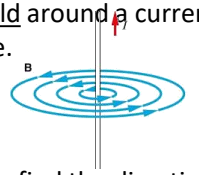
The Earth's Magnetic Field
The Earth's liquid iron core produces a magnetic field. It's south magnetic pole is actually at the Earth's geographical North pole. So the north pole of a compass points North.



Interacting Magnetic fields

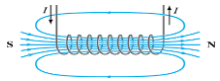


Magnetic field around a current carrying wire.



Q:How do we find the direction of the magnetic field around a current carrying wire?

Solenoid



Q:How do we increase the strength of the magnetic field created by the solenoid?

Transformer
Step-up transformers increase the potential difference by having more turns in the secondary coil.
Step-down transformers decrease the potential difference by having less turns on the secondary coil.

Q:How does the primary coil induce the current in the secondary coil?

Power in Transformers

$$P = I \times V$$
(W) (A) (V)

Electrical power output = electrical power input

Current in the primary coil, (V) → V_P
Current in the secondary coil, (V) → V_S

$$V_P \times I_P = V_S \times I_S$$

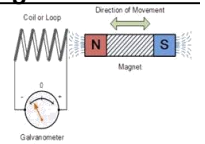
Potential difference in the primary coil, (V) → I_P
Potential difference in the secondary coil, (V) → I_S

National Grid
- High voltage during transmission to save energy
- Low voltage distributed to consumers for safety

The motor effect
A current carrying wire or coil can exert a force on a permanent magnet.

F = B x I x l
Force (N) = magnetic flux density (T) x current x length
Direction of force is found using Fleming's Left Hand Rule;

Electromagnetic Induction



Q:How can the induced potential difference be increased?

Application
DC electric motor
- **Coil spins**
- **Current is induced**
- **Current changes direction every ½ turn**
- **Split ring commutator swaps the connection every ½ turn to keep the current direct**

Q:How does an alternator work?
Microphones
- **Diaphragm (surrounded by coil of wire) moves with sounds waves**
- **Coil of wire surrounded by magnet**
- **Current generated**

Q:How does a loudspeaker work?

KS4 Physics, Paper 6, Topic 11 Magnetism and Electromagnets

Objectives		R	A	G
12.1	Recall that unlike magnetic poles attract and like magnetic poles repel			
12.2	Describe the uses of permanent and temporary magnetic materials including cobalt, steel, iron and nickel			
12.3	Explain the difference between permanent and induced magnets			
12.4	Describe the shape and direction of the magnetic field around bar magnets and for a uniform field, and relate the strength of the field to the concentration of lines			
12.5	Describe the use of plotting compasses to show the shape and direction of the field of a magnet and the Earth's magnetic field			
12.6	Explain how the behaviour of a magnetic compass is related to evidence that the core of the Earth must be magnetic			
12.7	Describe how to show that a current can create a magnetic effect around a long straight conductor, describing the shape of the magnetic field produced and relating the direction of the magnetic field to the direction of the current			
12.8	Recall that the strength of the field depends on the size of the current and the distance from the long straight conductor			
12.9	Explain how inside a solenoid (an example of an electromagnet) the fields from individual coils a add together to form a very strong almost uniform field along the centre of the solenoid b cancel to give a weaker field outside the solenoid			
12.10	**Recall that a current carrying conductor placed near a magnet experiences a force and that an equal and opposite force acts on the magnet**			
12.11	**Explain that magnetic forces are due to interactions between magnetic fields**			
12.12	**Recall and use Fleming's left-hand rule to represent the relative directions of the force, the current and the magnetic field for cases where they are mutually perpendicular**			
12.13	**Use the equation: force on a conductor at right angles to a magnetic field carrying a current (newton, N) = magnetic flux density (tesla, T or newton per ampere metre, N/A m) × current (ampere, A) × length (metre, m)**			
12.14 P	**Explain how the force on a conductor in a magnetic field is used to cause rotation in electric motors**			
13.1P	**Explain how to produce an electric current by the relative movement of a magnet and a conductor a on a small scale in the laboratory b in the large-scale generation of electrical energy**			
13.2	**Recall the factors that affect the size and direction of an induced potential difference, and describe how the magnetic field produced opposes the original change**			
13.3P	**Explain how electromagnetic induction is used in alternators to generate current which alternates in direction (a.c.) and in dynamos to generate direct current (d.c.)**			
13.4P	**Explain the action of the microphone in converting the pressure variations in sound waves into variations in current in electrical circuits, and the reverse effect as used in loudspeakers and headphones**			
13.5	**5 Explain how an alternating current in one circuit can induce a current in another circuit in a transformer**			
13.6	**Recall that a transformer can change the size of an alternating voltage**			
13.7P	**Use the turns ratio equation for transformers to calculate either the missing voltage or the missing number of turns: $V_P / V_S = N_P / N_S$**			
13.8	Explain why, in the national grid, electrical energy is transferred at high voltages from power stations, and then transferred at lower voltages in each locality for domestic uses as it improves the efficiency by reducing heat loss in transmission lines			
13.9	Explain where and why step-up and step-down transformers are used in the transmission of electricity in the national grid. Use the power equation (for transformers with100% efficiency): potential difference across primary coil (volt, V) × current in primary coil (ampere, A) = potential difference across sec			
13.11P_	**Explain the advantages of power transmission in high voltage cables, using the equations in 10.29, 10.31, 13.7P and 13.10**			

Seneca Assignment	Score (%)
12.1.1 Magnetic Materials	
12.1.2 Magnetic Fields	
12.2.1 Electromagnetism	
12.2.2 The Motor Effect	
12.2.3 Current Carrying Wire	
12.2.4 Current Carrying Wire 2	
12.2.5 End of Topic – Magnetism	

Seneca Assignment	Score (%)
13.1.1 Electromagnetic Induction	
13.1.2 Alternating Current	
13.1.3 Direct Current	
13.2.1 Transformers	
13.2.2 Step Up & Step Down	
13.2.3 High Voltage	
13.2.4 Grade 9 - Transformers	

KS4 Physics, Paper 6, Topic 12 Particle Model & Matter Knowledge Organiser

Bold text = higher content
Highlighted text = Triple Physics content

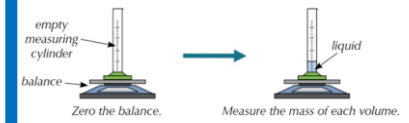
Language for Learning:

Absolute zero – The temperature at which the pressure of a gas drops to zero and the particles stop moving.
Atmospheric pressure – The pressure exerted by the weight of the air around us.
Compress – To squash something together to make it shorter or smaller.
Conserved – A quantity that is kept the same throughout, for example a substance does not change mass when it changes state.
Density – The mass of a substance per unit volume. It has units such as kg/m^3 or g/cm^3.
Direct proportion – A linear relationship in which one variable doubles as the other does.
Displace – To push out of the way.
Elastic – A linear relationship in which one variable doubles as the other does.
Extension – The amount by which a spring or other stretchy material has stretched. It is worked out from the stretched length minus the original length.
Inelastic – An inelastic material changes shape when there is a force on it but does not return to its original shape when the force is removed.
Kelvin – The unit in the kelvin temperature scale. One kelvin (1 K) is the same temperature interval as 1℃.
Kinetic theory – The model that explains the properties of different states of matter in terms of the movement of particles.
Linear relationship – A relationship between two variables shown by a straight line on a graph. For a linear relationship, the line does not have to go through the origin.
Non-linear relationship – A relationship between two variables that does not produce a straight line on a graph.
Normal – At right angles to a surface.
Pressure – The force on a certain area. It is measured in pascals or N/m^2.
Specific heat capacity – The energy needed to raise the temperature of 1 kg of a substance by 1℃.
Specific latent heat – The energy taken in or released when 1 kg of a substance changes state.
Spring constant – A measure of how stiff a spring is. The spring constant is the force needed to stretch a spring by 1 m.
State of matter – One of three different forms that a substance can have; solid, liquid or gas.
Sublimation – When a solid changes directly to a gas without becoming a liquid first.
Temperature – A measure of how hot something is.
Upthrust – A force that pushes things up in liquids and gases.

Density

$\rho = m / v$

Kg/m^3 Kg m^3



Q:Which piece of equipment is used to find the volume of the liquid? Which piece of equipment is used to find the mass of the liquid?

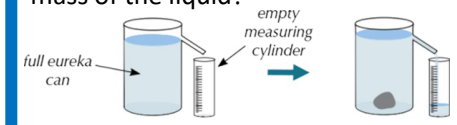


Figure 3: A eureka can and measuring cylinder being used to measure a solid's volume.

Q:What is the volume of the water displaced equal to?

States of Matter

Solids vibrate in a fixed position where atoms are close together and have strong forces between them.

Liquids flow around one another where atoms are close together but have gaps.

Gases move around quickly and randomly. The atoms are far apart and have weak forces between them.

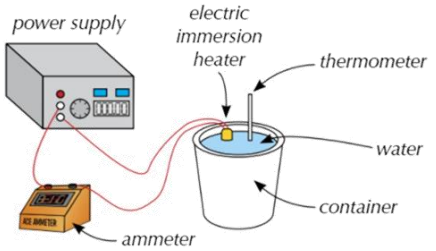
Temperature in K = Temperature in °C + 273

Temperature in °C = Temperature in K – 273

Specific Heat Capacity

$\Delta Q = m \times c \times \Delta\theta$

(J) (kg) (J/kg℃) (℃)



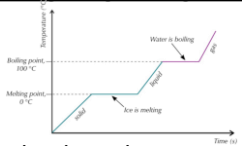
Q:How can the apparatus above be used to find the specific heat capacity of water?

Specific Latent Heat

$Q = m \times L$

(J) (kg) (J/kg)

Investigating Changes of State



Q:Why does the temperature of the water not change when it is melting and when it is boiling?

Gas Pressure

Gas particles collide with each other and the container. This leads to a force at right angles to the surface (pressure). The hotter the gas, the faster the particles move.

Q:What effect does this have on the pressure of the gas?

Pressure and Volume

$P_1 \times V_1 = P_2 \times V_2$

Doing work on a gas

Doing work on a gas increases its internal energy, which increases its temperature.

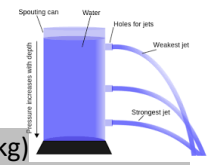
Pressure

$P = F / A$

(Pa) (N) (m^2)

Q: Explain the pressure exerted when using high heels and the pressure exerted when using snow shoes.

Pressure in a Liquid

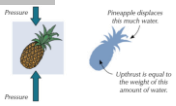


$P = h \times \rho \times g$

(Pa) (m) (kg/m^3) (N/kg)

Atmospheric pressure decreases the further you go in the air and increases the deeper you go in the sea.

Upthrust



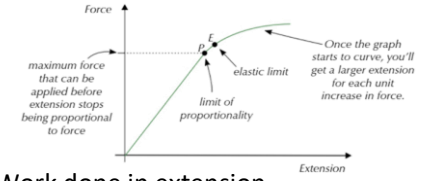
Q:Why do objects float?

Force and Extension

$F = k \times x$

(N) (N/m) (m)

Q:What apparatus would be needed to measure a spring's spring constant?



Work done in extension

$E = ½ \times k \times x^2$

(J) (N/m) (m)

KS4 Physics, Paper 6, Topic 12 Particle Model & Matter

Objectives		R	A	G
14.1	Use a simple kinetic theory model to explain the different states of matter (solids, liquids and gases) in terms of the movement and arrangement of particles			
14.2	Recall and use the equation: density = mass / volume			
14.3	Core Practical: Investigate the densities of solid and liquids			
14.4	Explain the differences in density between the different states of matter in terms of the arrangements of the atoms or molecules			
14.5	Describe that when substances melt, freeze, evaporate, boil, condense or sublimate mass is conserved and that these physical changes differ from some chemical changes because the material recovers its original properties if the change is reversed			
14.6	Explain how heating a system will change the energy stored within the system and raise its temperature or produce changes of state			
14.7	Define the terms specific heat capacity and specific latent heat and explain the differences between them			
14.8	Use the equation: $\Delta Q = m \times c \times \Delta\theta$			
14.9	Use the equation: $Q = m \times L$			
14.10	Explain ways of reducing unwanted energy transfer through thermal insulation			
14.11	Core Practical: Investigate the properties of water by determining the specific heat capacity of water and obtaining a temperature-time graph for melting ice			
14.12	Explain the pressure of a gas in terms of the motion of its particles			
14.13	Explain the effect of changing the temperature of a gas on the velocity of its particles and hence on the pressure produced by a fixed mass of gas at constant volume (qualitative only)			
14.14	Describe the term absolute zero, −273 °C, in terms of the lack of movement of particles			
14.15	Convert between the kelvin and Celsius scales			
14.16P	Explain that gases can be compressed or expanded by pressure changes			
14.17P	Explain that the pressure of a gas produces a net force at right angles to any surface			
14.18P	Explain the effect of changing the volume of a gas on the rate at which its particles collide with the walls of its container and hence on the pressure produced by a fixed mass of gas at constant temperature			
14.19P	Use the equation: $P_1 \times V_1 = P_2 \times V_2$ to calculate pressure or volume for gases of fixed mass at constant temperature			
14.20P	**Explain why doing work on a gas can increase its temperature, including a bicycle pump**			
15.1	Explain, using springs and other elastic objects, that stretching, bending or compressing an object requires more than one force			
15.2	Describe the difference between elastic and inelastic distortion			
15.3	Recall and use the equation for linear elastic distortion including calculating the spring constant: $F = k \times x$			
15.4	Use the equation to calculate the work done in stretching a spring: $E = ½ \times k \times x^2$			
15.5	Describe the difference between linear and non-linear relationships between force and extension			
15.6	Core Practical: Investigate the extension and work done when applying forces to a spring			
15.7P	Explain why atmospheric pressure varies with height above the Earth's surface with reference to a simple model of the Earth's atmosphere			
15.8P	Describe the pressure in a fluid as being due to the fluid and atmospheric pressure			
15.9P	Recall that the pressure in fluids causes a force normal to any surface			
15.10P	Explain how pressure is related to force and area, using appropriate examples			`
15.11P	Recall and use the equation: P = F / A			
15.12P	Describe how pressure in fluids increases with depth and density			
15.13P	**Explain why the pressure in liquids varies with density and depth**			
15.14P	**Use the equation to calculate the magnitude of the pressure in liquids and calculate the differences in pressure at different depths in a liquid: $P = h \times \rho \times g$**			
15.15P	**Explain why an object in a fluid is subject to an upwards force (upthrust) and relate this to examples including objects that are fully immersed in a fluid (liquid or gas) or partially immersed in a liquid**			
15.16P	**Recall that the upthrust is equal to the weight of fluid displaced**			
15.17P	**Explain how the factors (upthrust, weight, density of fluid) influence whether an object will float or sink**			

Seneca Assignment	Score (%)
14.1.1 Kinetic Theory Model	
14.1.2 Density	
14.1.3 Density 2	
14.2.1 Heat Capacity	
14.2.2 Latent Heat & Temperature	
14.2.3 Latent Heat Experiments	
14.2.4 End of Topic Test – Particle Model	
14.2.5 Grade 9 – Particle Models	

Seneca Assignment	Score (%)
15.1.1 Springs	
15.1.2 Hooke's Law	
15.1.3 Elastic Potential Energy	
15.2.1 Pressure	
15.2.2 Pressure in Gases	
15.2.3 Pressure in Liquids	
15.2.4 Pressure in Liquids 2	
15.2.5 Pressure in Liquids 3	
15.2.6 End of Topic Test – Forces & Matter	

KS4 Biology, Paper 2, Topic 6 Plant structures and their functions Knowledge Organiser

H = Higher content

Language for Learning:

Cellulose - Plant cell walls are made of tough cellulose, which support the cell and allow it to keep its shape.
Chloroplast - A green disc containing chlorophyll, found In plant cells.
This is where the plant makes glucose through photosynthesis.
Endothermic reaction - A type of reaction in which energy from the surroundings is transferred to the products, e.g. photosynthesis.
Gas exchange - A process in which one gas diffuses across a membrane and another gas diffuses in the opposite direction.
Glucose - The sugar produced by photosynthesis and needed for respiration.
Guard cell - A pair of guard cells open and close plant stomata.
Palisade cell - Tall, column-shaped cell near the upper surface of a plant leaf.
Photosynthesis - A series of enzyme-catalysed reactions carried out in the green parts of plants. Carbon dioxide and water combine to form glucose. This process requires energy transferred by light.
Respiration - A series of reactions occurring in all living cells, in which glucose is broken down to release energy.
Starch - A polymer carbohydrate that is made by the joining together of glucose molecules.
Stoma - A tiny pore in the lower surface of a leaf, which, when open, allows gases to diffuse into and out of the leaf. Plural is stomata.
Storage organ - A plant organ used to store energy-rich substances such as starch – for example, a potato.
Sucrose - The type of sugar found in the phloem of plants and used as table sugar.
Lignin - A type of polymer that is combined with cellulose in some plant cell walls to make the cells woody, e.g. in xylem cells.
Phloem tissue - Living tissue formed of sieve tubes and companion cells that transports sugars and other soluble compounds around a plant.
Potometer - A device used for measuring the rate of water uptake by a plant.
Sieve tube/cell - Tubes formed of phloem sieve cells (so called because the cells have holes in their ends). The tubes carry sugars and other soluble compounds around the plant.
Translocation - The transport of sugars (mainly sucrose) and other soluble compounds in the phloem tissue of a plant.
Transpiration - The flow of water into a root, up the stem and out of the leaves.
Xylem vessel/cell - A long, thick-walled tube found in plants, formed from many dead xylem cells. The vessels carry water and dissolved mineral salts through the plant.

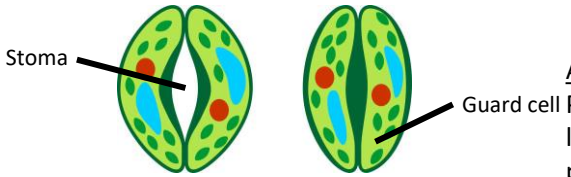
Photosynthesis

Occurs in the chloroplasts, light is absorbed by the green pigment chlorophyll.

carbon dioxide + water → glucose + oxygen

Glucose is stored as starch in the chloroplasts, it is broken down into sucrose to be transported around the plant.

Pores called stomata are found on the bottom of a leaf, they are controlled by guard cells. Stomata open during the day to allow water and gases to enter and exit the leaf. They close at night to prevent water loss by evaporation.

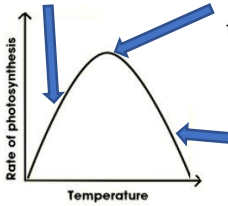


Leaves are adapted to carry out photosynthesis by having a large surface area, many chloroplasts and stomata.

Factors that limit photosynthesis

- Temperature
- Amount of carbon dioxide
- Light

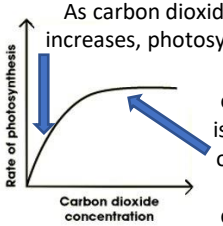
As temperature increases photosynthesis increases.



Optimum temperature for enzymes involved in photosynthesis.

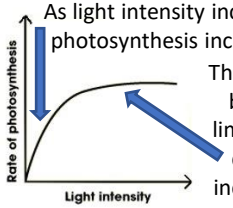
Further increase in temperature causes enzymes to denature and decreases the rate of photosynthesis.

As carbon dioxide concentration increases, photosynthesis increases.



The rate of reaction levels off because another factor is limiting the reaction (light or temperature), increasing carbon dioxide concentration will have no further effect.

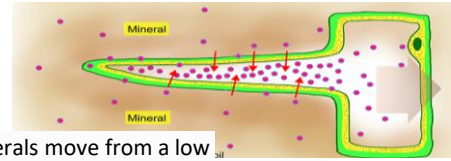
As light intensity increases, photosynthesis increases.



The rate of reaction levels off because another factor is limiting the reaction (carbon dioxide or temperature), increasing light intensity will have no further effect.

Absorbing water and mineral ions

Plants need water to keep cells rigid, to cool the leaves through evaporation and for photosynthesis. Plants absorb water and mineral ions through the root hair cells by active transport.



Minerals move from a low concentration to a high concentration.

Root hair cells have a large surface area and a thin cell wall. Active transport is the movement of particles **against** the concentration gradient and requires energy.

Translocation

The **xylem** transports water and mineral ions around the plant. Xylem cells die during their development so are rigid to withstand high water pressure. The top and bottom cell walls disintegrate to make a long hollow tube.

The **phloem** transports sugars around the plant, they have holes in the end of their cells to allow sugars to flow from one cell to another. They have no nucleus and little cytoplasm. They also have companion cells that make energy for active transport.

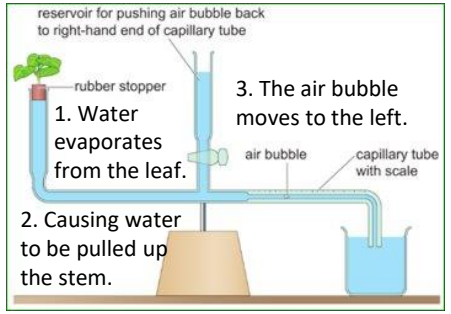
Transpiration

Is the flow of water into a root, up the stem and out of the leaves. Water moves up the xylem as an unbroken 'chain' due to the forces of attraction between water molecules. As water evaporates from the leaves, more water gets pulled up the stem.

The factors that affect transpiration are:

- Wind
- Humidity
- Temperature
- Light intensity

A **potometer** can be used to measure transpiration in a plant.



Inverse square law

To calculate a new light intensity (I_{new}) when the distance of a light source changes (from d_{orig} to d_{new}), we use:

$$I_{new} = \frac{I_{orig} \times d^2_{orig}}{d^2_{new}}$$

I_{new} is **inversely proportional** to d^2_{new} (light intensity is inversely proportional to the new distance squared). Light intensity varies with distance according to the **inverse square law**.

KS4 Biology, Paper 2, Topic 6 Plant structures and their functions Knowledge Organiser

Objectives		R	A	G
6.1	Describe photosynthetic organisms as the main producers of food and therefore biomass			
6.2	Describe photosynthesis in plants and algae as an endothermic reaction that uses light energy to react carbon dioxide and water to produce glucose and oxygen			
6.3	Explain the effect of temperature, light intensity and carbon dioxide concentration as limiting factors on the rate of photosynthesis			
6.4	**Explain the interactions of temperature, light intensity and carbon dioxide concentration in limiting the rate of photosynthesis**			
6.5	*Core Practical: Investigate the effect of light intensity on the rate of photosynthesis*			
6.6	**Explain how the rate of photosynthesis is directly proportional to light intensity and inversely proportional to the distance from a light source, including the use of the inverse square law calculation**			
6.7	Explain how the structure of the root hair cells is adapted to absorb water and mineral ions			
6.8	Explain how the structures of the xylem and phloem are adapted to their function in the plant, including: a lignified dead cells in xylem transporting water and minerals through the plant b living cells in phloem using energy to transport sucrose around the plant			
6.9	Explain how water and mineral ions are transported through the plant by transpiration, including the structure and function of the stomata			
6.10	Describe how sucrose is transported around the plant by translocation			
6.12	Explain the effect of environmental factors on the rate of water uptake by a plant, to include light intensity, air movement and temperature			
6.13	Demonstrate an understanding of rate calculations for transpiration			

Seneca Assignment	Score (%)
6.1.1 Photosynthesis	
6.1.2 Photosynthesis 2	
6.1.3 Grade 9 – Photosynthesis Experiment	
6.2.1 Water Transport	
6.2.2 Stomata	
6.2.3 Water Transport 2	
6.2.4 Nutrient Transport	
6.2.5 End of Topic Test - Plants	

KS4 Biology, Paper 2, Topic 9 Ecosystems and material cycles Knowledge Organiser

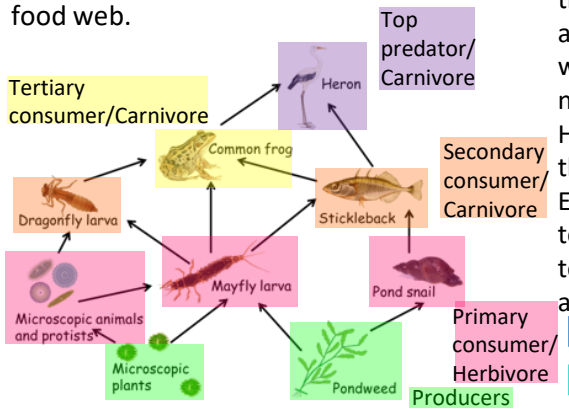
H = Higher content

Language for Learning:

Abundance - A measure of how common something is.
Community - All the different organisms living and interacting with one another in a particular area.
Ecosystem - An area in which all the living organisms and all the non-living physical factors in an area form a stable relationship that needs no input from outside the area to remain stable.
Food web - A diagram of interlinked food chains. It shows how the feeding relationships in a community are interdependent.
Habitat - The place in which an organism lives, e.g. woodland or sea shore.
Interdependent - When organisms in an area need each other for resources, e.g. for food and shelter.
Population - A group of one species living in the same area.
Quadrat - A square frame of known area, such as 1 m2, that is placed on the ground to get a sample of the organisms living in a small area.
Resources - Something that an organism needs to stay alive such as food, water and space.
Sample - A small portion of an area or population.
Abiotic factors - Non-living conditions that can influence where plants or animals live (e.g. temperature, the amount of light).
Belt transect - A line in an environment along which samples are taken to measure the effect of an abiotic factor on the distribution of organisms.
Distribution - The places in which a certain organism can be found in an area.
Biodiversity - The variety of species in an area.
Biotic factors - Living components (the organisms) in an ecosystem.
Mutualism - A relationship between individuals of different species where both individuals benefit, e.g. by getting more food or shelter than if they were on their own.
Parasitism - A feeding relationship in which a parasite benefits and its host is harmed.
Indigenous - Organisms that have always been in an area. (Another word for native.)
Non-indigenous - Organisms that have been introduced to an area where they haven't been before.
Desalination - A process that produces fresh drinking water by separating the water from the salts in salty water.

Ecosystems

An ecosystem is all the organisms and the environment they live in. A community is all the different organisms in a particular area.
A population is a group of the same species that live in a particular area.
Animals and plants within an ecosystem all interact and rely on each other for resources, they are **interdependent.**
We show interdependent relationships with a food web.



We use a quadrat to look at organisms present in a given area.

$$\text{Population size} = \text{number of organism in all quadrats} \times \frac{\text{total size of area where organisms live}}{\text{total area of quadrats}}$$

Abiotic Factors

Species have certain adaptations that mean they are particularly suited for certain conditions. If abiotic factors change, then the distribution of organisms may change too.

Biotic Factors

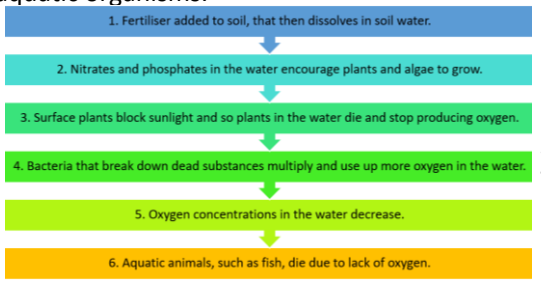
Competition arises between species when resources (light, space, food and water) are limited. The introduction of a new predator can also affect the number of organisms.

Parasitism and Mutualism

Parasites benefit by feeding off a host, causing harm to a host e.g. head lice. However, in a mutualistic relationship both organisms benefit from the relationship e.g. sea anemones and clown fish.

Biodiversity and Humans

Humans create fish farms to produce more fish that grow faster. However, the uneaten food and faeces can change the conditions of the water and harm the wild organisms that live nearby.
Human also introduce non-indigenous species that can affect a food web.
Eutrophication is the addition of extra nutrients to an ecosystem. It encourages plants and algae to grow rapidly and leads to the suffocation of aquatic organisms.



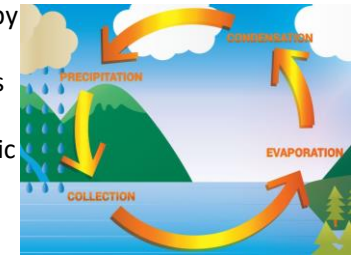
Preserving Biodiversity

Humans can also help to preserve biodiversity. Reforestation is the planting of trees, humans can also launch conservation schemes that:

- Protect a species habitat
- Protect a species outside of their natural habitat (zoos)
- Breed organisms in safe areas to increase the population.

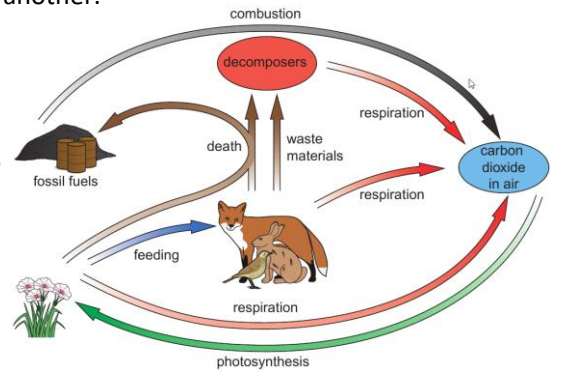
The Water Cycle

Water is needed by all organisms, the water cycle shows how it is recycled through the abiotic parts of an ecosystem.



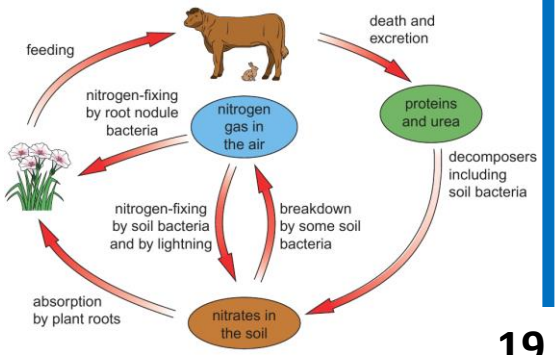
The Carbon Cycle

Carbon can be found in the air, stored in the ground, or present in living things. The carbon cycle shows how it is recycled from one place to another.



The Nitrogen Cycle

Nitrogen is an unreactive gas that makes up 80% of the atmosphere.



KS4 Biology, Paper 2, Topic 9 Ecosystems and material cycles Knowledge Organiser

Objectives		R	A	G
9.1	Describe the different levels of organisation from individual organisms, populations, communities, to the whole ecosystem			
9.2	Explain how communities can be affected by abiotic and biotic factors, including: a temperature, light, water, pollutants b competition, predation			
9.3	Describe the importance of interdependence in a community			
9.4	Describe how the survival of some organisms is dependent on other species, including parasitism and mutualism			
9.5	*Core Practical: Investigate the relationship between organisms and their environment using field-work techniques, including quadrats and belt transects*			
9.6	Explain how to determine the number of organisms in a given area using raw data from field-work techniques, including quadrats and belt transects			
9.9	Explain the positive and negative human interactions within ecosystems and their impacts on biodiversity, including: a fish farming b introduction of non-indigenous species c eutrophication			
9.10	Explain the benefits of maintaining local and global biodiversity, including the conservation of animal species and the impact of reforestation			
9.12	Describe how different materials cycle through the abiotic and biotic components of an ecosystem			
9.13	Explain the importance of the carbon cycle, including the processes involved and the role of microorganisms as decomposers			
9.14	Explain the importance of the water cycle, including the processes involved and the production of potable water in areas of drought including desalination			
9.15	Explain how nitrates are made available for plant uptake, including the use of fertilisers, crop rotation and the role of bacteria in the nitrogen cycle			

Seneca Assignment	Score (%)
9.1.1 Communities	
9.1.2 Interdependence and Ecosystem Stability	
9.1.3 Material Cycles	
9.1.4 Nitrogen and Water Cycles	
9.1.5 Sampling Biodiversity	
9.1.6 Biodiversity Practical	
9.1.7 End of Topic Test – Ecosystems	
9.1.8 Grade 9- Ecosystems	
9.2.1 Humans and Biodiversity	

KS4 Spanish -- UNIVERSALS

GIVING OPINIONS

Me gusta//No me gusta	I like//I don't like
Me gusta mucho	I really like
Me gusta bastante	I quite like
Me **gustaría/encantaría**	I would **like/love**
No me gusta nada	I don't like it at all
Me encanta/Me chifla	I love
Detesto	I detest
Odio	I hate
No aguanto	I can't stand
Prefiero	I prefer
Personalmente	Personally
Pienso que/ creo que	I think that
En mi opinión	In my opinión
Diría que	I would say that
Le diría que	I would tell him/her
Desde mi punto de vista	From my point of view
Me parece que	It seems to me that
Me interesa	I am interested in
Lo bueno **fue/es/será** que	The good thing **was/is/will be** that
Lo malo **fue/es/será** que	The bad **thing was/is/will be** that
Lo mejor **fue/es/será** que	The best **thing was/is/will be** that
Lo peor **fue/es/será** que	The worst **thing was/is/will be** that
Lo más divertido **es** que	The funniest thing **is** that
Lo que más me apasiona	What I am most passionate about
Lo que me preocupa es que	What worries me is that
Me preocupa que	It worries me that
Me molesta que	It bothers me that
Me fastidia/irrita que	It annoys me that
Una ventaja es que	One advantage is that
Otra ventaja es que	Another advantage is that
Una desventaja es que	One disadvantage is that
Otra desventaja es que	Another disadvantage is that
Encuentro que	I find that
Tengo la impression de que	I have the impression that
¡Qué disparate!	What a nonsense!
¡Qué tontería!	What a silly thing to say!
¡Qué guay!	How cool!

JUSTIFYING YOUR OPINIONS

Lo paso bien	I have a good time
Me hace sentir bien	He/she/it makes me feel good
Me hace reír	He/she/it makes me laugh
Me divierto	I have fun
Vale la pena	It is worth it
Me vuelve loco/a	I am crazy about he/she/it
Me chifla/mola	I love it
Se me da/dan bien	I am good at
Lo paso mal	I have a bad time
Me hace sentir bien	He/she/it makes me feel bad
Estoy harto/a	I am fed up with
Me aburro	I get bored
Me pone triste	He/she/it makes me sad
Me molesta/fastidia	He/she/it annoys me
Me vuelve loco/a	He/she/it drives/make me crazy
Me pone de los nervios	He/she/it gets on my nerves

ALREADY MADE TOP VERBS/STRUCTURES

Me ayuda a	He/she/it helps me
Te ayuda a	He/she/it helps you
Trato de + (infinitivo)	I try to + (infinitive)
Tengo que + (infinitive)	I have to + (infinitive)
En vez/lugar de + (infinitive)	Instead of + (infinitive)
Sería mejor	I would be better
Es esencial	It is essential to
Es inaceptable	It is unacceptable to

SUBJUNCTIVES (use with the sense of future)

Cuando tenga dinero…	When I have money…
Cuando sea mayor…	When I am older…
Cuando vaya…	When I go to…
Cuando pueda…	When I can…
Si tuviera…	If I had…

RELATIVE CLAUSES

Que se llama(n)…	That/who is(are) called…
Que está en…	That it is in…
Lo cual es bueno/malo…	Which is good/bad…

KEY VERBS (YOU MUST KNOW)

Fue/era, es, será	He/she/ it was, is, will be	||	Estuvo/estaba, está, estará	He/she/ it was, is, will be
Pude/podía, puedo, podré	I could, I can, I will be able to	||	Hice/hacía, hago, haré	I did/made, I do/make, I will do/make
Fui/iba, voy, iré	I went, I go, I will go	||	Quise/quería, quiero, querré	I wanted, I want, I will want
Tuve/tenía, tengo, tendré	I had, I have, I will have to	||	Podría, debería, quisiera	I could, I should, I would like
Solía	I used to	||	Se puede, puedes	One can, you can
Suelo	I tend to/ I usually	||	Se debe	One must
Hay que	One must/it is necessary to			
Hubo/había, hay, habrá	There was/were, there is/are, there will be			

TIME MARKERS - PRESENT

Normalmente	Normally/Usually
Siempre	Always
Nunca	Never
A veces	Sometimes
Cada día/semana/mes/año	Every day/week/month/ year
Ahora	Now
Hoy	Today
Por lo general	Generally/In general
Todo el tiempo/rato	All time
Hoy en día	Nowadays
De vez en cuando	From time to time
Por el momento	At the moment
Por la mañana	In the morning
Por la tarde	In the afternoon/evening
Por la noche	At night
Esta noche	Tonight

TIME MARKERS – PAST

En el pasado	In the past
Ayer	Yesterday
El lunes pasado	Last Monday
La semana pasada	Last week
El fin de semana pasado	Last weekend
El mes/año pasado	Last month/year
El verano pasado	Last summer
Anoche	Last night
Durante 2 años	For 2 years
Desde hace 2 meses	For 2 months (perfect tense)
Hace una semana	A week ago
Hace unos días	A few days ago

TIME MARKERS - FUTURE

En el futuro	In the future
Mañana	Tomorrow
El próximo lunes	Next Monday
La próxima semana	Next week
El próximo fin de semana	Next weekend
El próximo mes/año	Next month/year
Dentro de 2 meses	In 2 months' time

Connectives

Y	And
Porque	Because
Pero	But
Sin embargo	However
Aunque	Although
Además	Moreover/Besides
No obstante	Nevertheless
Así que	So
Dado que	Given that
Es decir	In other words
Por lo tanto	Therefore
Por un lado	On the one hand
Por otro lado	On the other hand
Por una parte	On the one hand
Por otra parte	On the other hand

SEQUENCERS

Primero	First
Luego	Then/Next
Después	Afterwards
Más tarde	Later on
Finalmente	Finally

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(V1)

ADJECTIVES

Alucinante	Mindblowing	||	Útil	Useful	||	Impresionante	Impressive
Asombroso	Astonishing	||	Genial	Great	||	Estimulante	Stimulating
Reconfortante	Reassuring	||	Fácil	Easy	||	Sorprendente	Surprising
Fascinante	Fascinating	||	Guay	Cool	||	Inolvidable	Unforgettable
Increíble	Incredible	||	Atractivo	Attractive	||	Maravilloso	Marvellous
Emocionante	Exciting	||	Relajante	Relaxing			
Embarazoso	Embarrassing	||	Inútil	Useless	||	Repugnante	Repugnant
Una pesadilla	A nightmare	||	Feo	Ugly	||	Horrible	Awful
Bochornoso	Mortifying	||	Difícil	Difficult	||	Inquietante	Worrying
Molesto	Annoying	||	Raro	Strange	||	Estresante	Stressful
Lamentable	Unfortunate	||	Agotador	Tiring	||	Asqueroso	Disgusting
Aterrador	Terrifying	||	Irritante	Irritating			

Your class notes

People

En la foto...

hay ___ personas
no hay gente
no hay nadie

Puedo ver...

unas personas
una familia
un grupo de amigos

unos animales
un edificio
la naturaleza
el paisaje
el mar
la montaña

Action

Él/ella está
Ellos/ellas están:

jugando
comiendo
haciendo
mirando
yendo
paseando
bebiendo
tomando
viajando
descubriendo
riendo

porque – pero – sin embargo – no solo...sino también

Location

Está..

adentro
en el colegio
en casa
en el trabajo
en el centro comercial

afuera
en la playa
en el parque
en la montaña
en el campo

Mood

Él/ella está:
Ellos/ellas están:

contento/a(s)
triste(s)
cansado/a(s)
enfocado/a (s)

Él/ella tiene:
Ellos/as tienen:

hambre
sed
frío
calor

Weather

Hace...

buen tiempo
mal tiempo
frío
calor
sol
viento

Hay...

niebla
sol
granizo

Está...

nublado
oscuro
Lluvioso

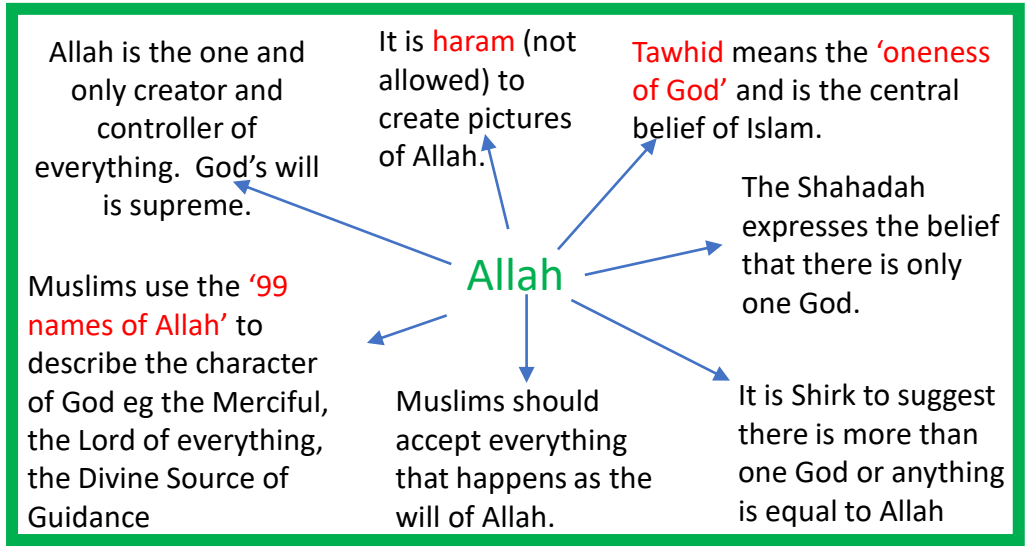
Llueve/
está lloviendo
Nieva

pienso que - en mi opinión - creo que - parece que - se puede ver que – obviamente - evidentemente

Eduqas Religious Studies: Muslim beliefs and teachings.

Language for Learning:

- Sunni
- Shi'a
- Tawhid
- Shirk
- Al'Qadr
- Malaikah
- Akhirah
- Kutub
- Nubuwwah
- Usul ad-din
- Adalat
- Inamate
- Al Ma'ad
- Risalah
- The Qur'an
- The hadith
- The Sunnah
- Jannah
- Jahannam
- Barzakh
- Yawm ad-Din
- Laylat al-Qadr



The Five Roots of Usul ad-Din (Shia – approx. 15% of Muslims.

1. Tawhid: absolute faith in the oneness of Allah.
2. Adalat: Divine justice; Allah is always fair and just and will decide who goes to Jannah/Jahannam on the Day of Judgement.
3. Nubuwwah: The belief in Prophets.
4. Imamate: the belief that there were 12 Imams who were chosen by Allah to lead Islam after Muhammad (pbuh)
5. Al Ma'ad: All Muslims will be resurrected and judged by Allah at the end of time.

The 6 Articles of Faith (Sunni – approx. 85% of Muslims)

1. Tawhid: Absolute faith in the Oneness of Allah
2. Malaikah: belief in angels who are immortal beings made of light. Allah sends angels to pass on messages to his Prophets, they record our good/bad deeds, they care for us and welcome Muslims to Jannah or supervise them in Jahannam.
3. Kutub: Believe in the Holy books – the Qur'an is the direct word of Allah but there is also the Hadith, the Tawrat and the Sunnah.
4. Nubbuwah: believe in the Prophets who should be respected but not worshipped. Prophethood is called Risalah which means 'message'. There are 25 named prophets in the Qur'an, ending with the Prophet Muhammad (pbuh) who received the Qur'an from the Angel Jibril on the Night of Power.
5. Akhirah: the belief in the afterlife. When they die, Muslims will wait in Barzakh until a trumpet sounds to signal the Day of Judgement. At this time, the Angel of Death (Azra'il) will collect all souls and bring them in front of Allah, where 2 angels will question the soul to help Allah decide whether it will go to Jannah (Heaven) or Jahannam (Hell).
6. Al-Qadr: The belief in pre-destination; all that happens in part of Allah's plan for creation. This means that Allah has decided everything that will happen in the world and our lives are already set out. Suni Muslims believe that Allah has made it impossible for them to choose anything other than what he has chosen.

Eduqas GCSE: Component 3: Islamic practices.

Language for Learning:

Five Pillars of Islam
Shahadah
Salat
Zakat
Sawm
Hajj
Khums
Jihad – greater and lesser
Mecca
Amr-bil-Maroof
Shari'ah Law
Nahil Anril Munkar
Tawalia
Tabarra
Tawhid
Wudu
Ummah
Rak'ahs
Du'a
Eid-ul-Adha
Eid-u;-Fitr
Jummah

Worship

Muslims worship both at home and in the Mosque. Whilst praying Muslims will always face the Ka'ba in Mecca; they will use a qiblah to show them the correct direction to pray in.

In a Mosque	At home
Muslims will use a prayer mat and face Mecca. They will perform a series of rak'ahs when praying. Men and women pray separately Men are obliged to go to Friday prayers (Jummah)	Muslims will complete most of the set prayers (salat) at home. Some may have a set room for this. Many Muslims will complete additional, personal prayers called Du'a.

Festivals

1. Eid-ul-Adha: commemoration of sacrifice and marks the end of Hajj. It reminds Muslims of the trials of Ibrahim when he was asked to sacrifice his son Isma;il. Muslims may attend prayers at the Mosque and traditionally would slaughter a lamb.
2. Eid-ul-Fitr: marks the end of Ramadan and is a day of thanksgiving to Allah. A special zakah is collected and Muslims will gather to eat and give gifts.
3. Ashura (Shi'a): commemorates the lives of their Imams and the Martyrdom of Husayn, the grandson of Muhammad.
4. Eid-ul Ghadeer (Shia): celebrates the appointment of Ali ibn Abi Talib as Muhammad's successor. Shi'a Muslims will give gifts and take part in ritual baths and celebratory meals.

The Five Pillars of Islam (Sunni)

1. Shahadah: Declaration of faith 'There is no God but Allah and Muhammad is his prophet.'
2. Salat: 5 daily prayers said by Muslims after a ritual washing known as wudu.
3. Zakah: obligatory charity of 2.5% of a Muslim's annual wealth.
4. Sawm: religious action of fasting during daylight hours during the month of Ramadan.
5. Hajj: pilgrimage to Mecca – all Muslims will try to complete this once in their lives.

Shi'a Muslims will also complete the 10 Obligatory acts:

1: Salat,
2: Sawm
3: Zakat
4. Hajj
5.Jihad
6. Khums: 20% annual tax on profits given to Islamic Educational charities.
7. Amr-bil.Marrof: encouraging people to follow Shari'ah law.
8. Nahil Anril Munkar: Discouraging people from doing wrong.
9. Tawalia: showing love to Allah and those who follow him
10. Tabarra: Disassociating with the enemies of Allah.

Jihad = Struggle

Greater Jihad	Lesser Jihad
The personal, inner struggle to be a good Muslim and follow the rules of Islam. This is seen as a constant duty and an act of worship. Muslims are individually responsible for their own actions.	Defending Islam from threats. 'Permission to fight has been given to those who are being fought, because they were wronged.' It has a very strict set of rules.

Knowledge Organiser
BTEC Level 1/2 Tech Award in Health and Social Care
Component 3: Learning Aim A – Factors that affect health and wellbeing

Language for learning

Types of factors
- Physical and lifestyle
- Social, emotional and cultural
- Economic
- Environmental

Types of effect
- Positive
- Negative
- Effect

Types of wellbeing
- Physical health
- Intellectual wellbeing
- Emotional wellbeing
- Social wellbeing
- Health and wellbeing

Life events
- Relationship changes
- Life circumstances (expected and unexpected)

Physical and lifestyle factors

Genetic inheritance
Inherited e.g. Down's Syndrome
Predisposition e.g. Diabetes
PIES

Ill health
Acute e.g. heart attack
Chronic e.g. heart disease
PIES

Diet
Eatwell guide. 2000/2500 Kcal per day
Overeating
Undereating
PIES

Exercise
2.5 hrs pr week
Active
Inactive
PIES

Substance use
Alcohol
Smoking
Drugs – illegal/prescription
PIES

Personal hygiene
Bacteria, growth, spread of infection
PIES

Social/emotional/cultural factors

Social interactions
Formal/informal
Supp/unsupportive
Integration/isolation
PIES

Stress
Positive/negative effects
Short term/long term effects
PIES

Willingness to seek help
Culture
Gender
Education
PIES

Economic factors

Financial resources
High income
Low income
PIES

Environmental factors

Pollution
Air
Water
Noise
PIES

Housing
Home environment
- Condition/damp
- Size/crowded
- Location
- Conflict

Rural/urban
PIES

Questions to consider

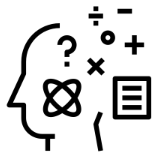
Question 1: Factors
Explain 1/2/3/4 factors that could have a positive/negative effect on the health and wellbeing of …
Explain 1/2/3/4 physical/lifestyle/ social/emotional/cultural/ economic/environmental factors that could have a positive/negative effect on the health and wellbeing of…
Explain 1/2/3/4 factors that could affect the physical health /intellectual/emotional/ social wellbeing of …

Question 2: Life events
Explain 1/2/3/4 impacts of (life event) on the physical health/intellectual/emotional/ social wellbeing of …

The bigger picture
Can you think about actions to improve health and wellbeing?

Relationship changes ← **LIFE EVENTS** → **(expected) Life circumstances (unexpected)**

- **New relationships** PIES
- **Marriage** PIES
- **Parenthood** PIES
- **Divorce** PIES
- **Bereavement** PIES
- **Starting /leaving school** PIES
- **Moving house** PIES
- **New job** PIES
- **Retirement** PIES
- **Accident/ injury** PIES
- **Ill health** PIES
- **Unemploy-ment** PIES
- **Imprison-ment** PIES



Preparation for the BTEC Examination External Assessment
BTEC Level 1/2 Tech Award in Health and Social Care
Component 3: Learning Aim A – Factors that affect health and wellbeing

From the specification: AO1 Demonstrate knowledge and understanding of factors that affect health and wellbeing
For Level 2 Distinction: Learners demonstrate a high level of knowledge and understanding of factors that affect health and wellbeing. They explain clearly how different factors have positive and negative impacts on health and wellbeing, including the impact of a specific life event on wellbeing.
For Level 2 Pass: Learners demonstrate knowledge and understanding of factors that affect health and wellbeing. They explain how different factors have positive or negative impacts on health and wellbeing, including the impact of a specific life event on wellbeing.

Questions

Question 1:
Explain 1/2/3/4 factors that could have a positive/ negative effect on the health and wellbeing of …

Explain 1/2/3/4 physical/lifestyle/social/emotional/cultural/economic /environmental factors that could have a positive/ negative effect on the health and wellbeing of…

Explain 1/2/3/4 factors that could affect the physical health/intellectual /emotional/social wellbeing of …

Question 2:
Explain 1/2/3/4 impacts of (life event) on the physical health/ intellectual /emotional/social wellbeing of …

Literacy signposts

Try to use subject specific terminology e.g. substance use/personal hygiene/supportive relationships.

Question 1:
- One factor is …. This can have a positive/negative effect on his/her wellbeing because …
- …… can have a positive/negative effect on his/her … health/wellbeing because …
- ……. has an effect on his/her health/wellbeing because this means that …
- …… can result in/can lead to …… This has an effect on his/her health/wellbeing because ...
- He/she has ... which can affect his/her physical health/intellectual/emotional/social wellbeing because …

Question 2:
- This may cause ……. to experience/suffer from …… which would have a positive/negative effect on his/her physical health/ intellectual /emotional/social wellbeing because …
- He/she may feel …. because … which could have a positive/negative effect on his/her physical health/ intellectual/emotional/social wellbeing

Mark scheme

Question 1 (a) (b) (c) (d): 12 marks
Award one mark for identifying one factor that has an effect on the individual's health and wellbeing and one mark for a linked expansion up to a maximum of four marks. In each case, award one mark for identifying a relevant factor from the information given and the second mark for describing how it could be having this effect on health and wellbeing.

Question 2 (a) (b): 6 marks
Award one mark for identifying one effect of the life event on his/her health and wellbeing and one mark for a linked expansion up to a maximum of two/four marks.

No credit for general descriptions of factors that are not linked to the provided information.

No credit for re-stating the information in the case study without using it to answer the question.

Knowledge Organiser
BTEC Level 1/2 Tech Award in Health and Social Care
Component 3: Learning Aim B – Interpreting Health Indicators

Language for learning

Lifestyle data
- Smoking
- Alcohol
- Inactivity
- Poor diet
- Other substance abuse (legal or illegal)

Physiological data
- Pulse/heart rate
- Blood pressure
- Peak flow
- Body mass index (BMI)

Questions to consider

Question 3: Lifestyle and physiological indicators

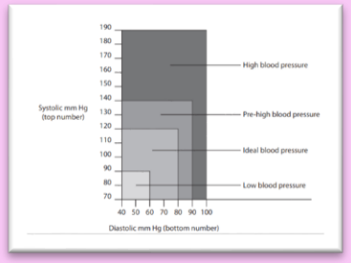
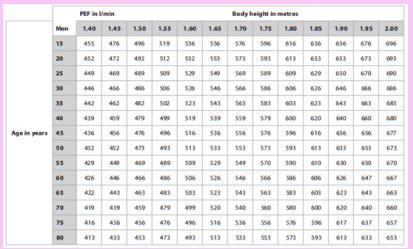
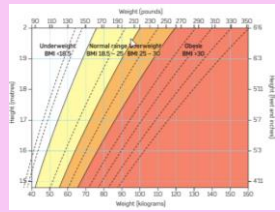
Explain what the data provided by the practice nurse suggests about the person's:
- **Current physical health**
- **Risks to future physical health**

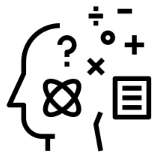
The bigger picture
Can you think about recommended actions and short/long term targets to improve health and wellbeing?

Lifestyle indicators

Indicator	Smoking	Alcohol	Inactivity	Poor diet	Other substance abuse
Healthy range	None	14 units per week	3-5 times per week (mod/int)	2000/2500 Kcal, Eatwell Guide, 5 a Day	None
Risks to current physical health	Breathing problems Smoker's cough, unfit May make asthma worse	Risky behaviour, hangover Mood swings Alcohol poisoning	Overweight, unfit Get out of breath easier Reduced metabolism	Overweight/underweight Malnourished, low energy Deficiency eg anaemia	Risky behaviour, accidents Mood swings Heart palpitations
Risks to future physical health	Cancer - lungs, mouth Addiction, lung disorders Heart attack, stroke	Liver disease/failure Addiction, mental health problems, heart attack	Heart disease, obesity Cancer Mobility issues, joint problems	Type 2 diabetes, obesity Eating disorder Cancer, heart disorders	Death, heart or brain damage Addiction Mental health problems

Physiological indicators

Indicator	Pulse/heart rate (bpm)	Blood pressure (mmHg)	Peak flow (L/min)	Body mass index [BMI] (kg/m²)
What it means	How fast your heart is beating	Pressure exerted by your blood against the walls of your arteries	How quickly you can blow air out of your lungs	Amount of fat in your body in relation to your height
Healthy ranges	**Normal values of heart rate at different ages** Age – Heart rate (beats/min) 0 – 6 months: 120–140 6 – 12 months: 95–120 1 – 5 years: 90–110 6 – 10 years: 80–100 >10 years: 60–100			**BMI** Weight categories – BMI (kg/m²) Underweight: <18.5 Healthy weight: 18.5–24.9 Overweight: 25–29.9 Obese: 30–34.9 Severely obese: 35–39.9 Morbidly obese: ≥40 
Risks to current physical health	Poor fitness levels, harder to exercise. May have unhealthy lifestyle May feel dizzy/ sweaty. Heart is having to work harder.	Hypertension (too high) - May be stressed Hypotension (too low) - May feel dizzy/faint	Asthma may get worse Chest infection Breathing difficulties Shortness of breath Unable to exercise	Overweight - Tiredness, shortness of breath - Reduced mobility, harder to exercise Underweight - Potential eating disorder/undiagnosed illness
Risks to future physical health	Heart disease Artery damage Premature death	Heart disease, heart failure, heart attack Kidney disease Strokes	Lung cancer Emphysema Respiratory infections e.g bronchitis	Heart disease, heart failure, heart attack Obesity, type 2 diabetes, stroke Joint problems/ arthritis Increased risks of cancer



Preparation for the BTEC Examination External Assessment
BTEC Level 1/2 Tech Award in Health and Social Care
Component 3: Learning Aim B – Interpreting Health Indicators

From the specification: AO2 Interpret health indicators
For Level 2 Distinction: Learners They demonstrate the ability to interpret lifestyle and physiological data to explain factors that could potentially affect an individual's current and future physical health.
For Level 2 Pass: Learners demonstrate a high level of ability to interpret lifestyle and physiological data to explain clearly, and in detail, factors that could potentially affect an individual's current and future physical health.

Question 3

You will be provided with some lifestyle and physiological data about the individual.
There will be three sections. One for 'lifestyle' data and then two separate physiological data sections (do not get these mixed up). For each section you must:

Explain what the data provided by the practice nurse suggests about the person's:
- Current physical health
- Risks to future physical health

Literacy signposts

Lifestyle indicators: interpret the information provided and identify if the person's habits are in a healthy range or not. Then explain the impact on current health and risks to future health.

Current health:
- *By smoking cigarettes he/she may have breathing problems/be unfit/have a smoker's cough.*
- *Drinking more than the recommended weekly units of alcohol will make him/her more likely to suffer from hangovers which cause headaches and a low mood.*
- *His/her inactivity suggests that he/she may be unfit/more likely to get out of breath easily/have a reduced metabolism which can make him/her more likely to be overweight.*

Risks to future health:
- *Smoking increases the risk of …*
- *Drinking this much alcohol can cause future health problems including…*
- *If he/she does little exercise this can lead to … in the future because …*

Physiological indicators: interpret the data from the graph/table you have been given and identify if the measure is too high or low. Then explain the impact on current health and risks to future health.

Current health:
- *His/her pulse rate is too fast. This suggests that they may have poor fitness levels and …*
- *His/her blood pressure is too high which could show that they are suffering from stress.*
- *His/her peak flow is low for her age suggesting he/she may have some breathing difficulties.*
- *The low BMI shows that … is underweight. This could mean they are feeling tired and lack energy.*

Risks to future health:
- *This can result in …*
- *This could lead to …*
- *This puts him/her at a higher risk of …*
- *In the future this could cause …*

Mark scheme

Data must be interpreted accurately.

There is a clear and detailed explanation of current state of health.

There is a clear and detailed explanation of potential health risks.

Examiners' report

Learners must accurately interpret the physiological and lifestyle data, and not just directly quote them.

Learners must provide interpretation or analysis of the data to fully show their knowledge and understanding.

Learners must fully explain the impact on current physical health. Learners must fully explain the risks to future physical health.

Learners must not repeat similar risks across all three sections.

Knowledge Organiser
BTEC Level 1/2 Tech Award in Health and Social Care
Component 3: Learning Aim C – Person-centred health and wellbeing improvement plans

Creating a health and wellbeing improvement plan:

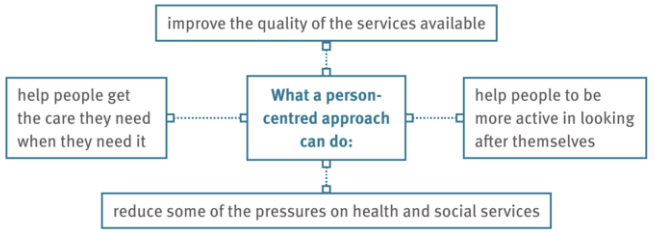
Recommended Actions: Clearly described action to improve health and wellbeing
Examples: Improve socialisation skills so that he can make friends. Lose weight so that she can improve her mobility problems. Reduce alcohol intake to help reduce the physical health risks.
SMART Targets
Specific: The target should be as clear as possible stating exactly what you mean. **M**easurable: What are the success criteria for this target? Include a measure/amount. **A**chievable: Is this possible/do-able? **R**ealistic: Is it realistic that this person can do this? **T**imebound: What are the timeframes/deadlines for achieving this target?

Short Term Targets (Less than six months)	Long Term Targets (More than six months)
Examples: Within 1 month, Suzie should be having no more than 10 units of alcohol at the weekend.	Examples: Within 7 months, Suzie should be having no more than 5 units of alcohol at the weekend.

Sources of support?	Types of support?	How this helped to cope and adapt?
Formal support: Trained professionals with skills and experience e.g. NHS/private staff, health specialists, social workers, carers, physiotherapists, occupational therapists, counsellors.	**Emotional Support:** - Somebody to talk to - Listening to the person **Information and advice:** - Explain how to find treatment/help - Give information about choices available - Help to make appropriate choices - Offer advice **Practical help:** - Financial support - Help with transport - Support everyday tasks - Make adaptations where needed e.g to home/work or vehicles	**This helped the individual to cope/ adapt/ adjust/ deal with the life event by/ because:** - Support to adapt to change - Support to adapt to new circumstances - Help towards acceptance of the situation - Help to come to terms with the situation - Help overcome the effects of the event - Help to feel less frightened - Help the person to be more resilient - Improve positivity - Help to deal with loss of control - Help to overcome other life events or experiences - Provide reassurance - Support to cope emotionally - Support to deal with the event - Provide a sense of security - Improve self-esteem and confidence - Reduce anxiety, depression or stress - Provide encouragement - Support with physical recovery - Support with psychological recovery
Informal support: Unpaid support e.g. family, friends or neighbours.		
Voluntary support: Local or national groups, charities, community groups or faith-based organisations.		

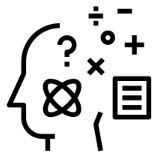
Person-centred care:

A person centred approach takes into account the individual needs, wishes and circumstances. It is coordinated and tailored to the needs of the individual. It ensures that people are always treated with dignity, compassion and respect.



Obstacles to implementing the plans

Obstacle?		Why is this a problem?	Ways to overcome the obstacle?
Emotional and psychological	Lack of motivation	Difficult to get started	Start off small and reward themselves, make a plan
	Low self esteem	No confidence to believe they can succeed	Seek out support, reward themselves
	Acceptance of current state	No need to change if healthy right now	Show statistics and long-term effects
Time constraints	Work/study	Less spare time to complete the action plan	Exercise on way to/from work, make a plan
	Family	Children/partner need looking after	Family to join in the actions, ask a friend to babysit
Lack of resources	Lack of finances/money	Can't afford the service/services under-resourced	Search for free activities e.g. exercise outdoors/online
	Lack of equipment	Don't own the equipment needed	Borrow the equipment, look online for alternatives
Lack of support	Diet	Family also share the same poor diet	Get them to plan/cook/eat with you
	Smoking	Family or friends still smoke	Ask them to smoke away from you
	Drinking alcohol	Family or friends offer alcohol	Ask them to respect you, socialise in a different way
Individual factors	Ability/disability	Might be harder to achieve the targets	Social care staff/family to support
	Addiction	Habits hard to break/cravings	Emotional support, use self-talk, nicotine patches
Geographical barrier	Live too far away from services	Difficult to get to services far away	Look for alternatives, share a lift
Culture barrier	Different culture or language	Harder to understand and complete the actions	Avoid slang/jargon, ask family/friends to translate



Preparation for the BTEC Examination External Assessment
BTEC Level 1/2 Tech Award in Health and Social Care
Component 3: Learning Aim C – Person-centred health and wellbeing improvement plans

From the specification: AO3 (Design a person-centred health and wellbeing improvement plan) and AO4 (Demonstrate knowledge and understanding of how to overcome obstacles relating to health and wellbeing improvement plans).

Question 4:
Design a health and wellbeing improvement plan for your individual.
Use all the above information provided about your individual so far.
This will require three recommended actions.
For each action:
- Make the recommended action
- Set a short-term target (SMART)
- Set a long-term target (SMART)
- Suggest a formal/ informal/ voluntary/ other source of support and explain how this will help.

Question 5:
Explain how your plan takes into account the individual's needs, wishes and circumstances.
This will require four paragraphs explaining/justifying for each action:
- Why you chose the action
- Why you chose the short and long-term targets (SMART)
- Why your chosen support is appropriate and suitable
- How your plans are person-centred (how they are involved in the decision making; taking into account their needs, wishes and circumstances)

Question 6:
Describe potential obstacles the individual may experience when trying to follow your health and wellbeing improvement plan and suggest how these could be reduced or overcome.
This will require use of four paragraphs explaining any barriers he/she may face, and how these can be overcome/mitigated.

Literacy Signposts/WAGOLLs:

Question 4:
Action:
Suzie needs to reduce her alcohol intake to the recommended levels to lower her risk of addiction and liver damage. To assist this, she needs to reduce her binge-drinking at the weekend.
Short term target:
Within one month, Suzie should have only 10 units of alcohol at the weekend.
Long term target:
Within 5 months, Suzie should have no more than 5 units of alcohol at the weekend and this should be spread out over three days.
Source of support:
Her husband Dave will provide informal support by giving her encouragement so that she doesn't lose motivation. He could also join her and reduce his alcohol intake too to make it easier for Suzie.

Question 5:
I chose for Suzie to reduce her alcohol intake as she is currently drinking more than the recommended levels. This will be beneficial because she if this doesn't improve she will be at risk of a fatty liver which could lead to liver failure. This suits her wishes since she had requested to work on improving this. It would also help to manage her stress levels better aswell. I have tried to make her targets as realistic and achievable as possible. She enjoys socialising so I have suggested that she reduce her amounts gradually so she can still see her friends at the pub every Saturday. However by drinking less alcohol she will also be saving money which will helps with her gym membership for the next action. I have suggested that her husband support her as she lives with him. He can offer emotional support and encouragement which will make her more likely to succeed with her action plan. This plan is person centred because Suzie has been actively involved in deciding on appropriate actions and it has taken Suzie's current circumstances into account. It will also help her to be more pro-active in her own health and wellbeing.

Question 6:
A further issue Sarah might have is her low self esteem. This is because it is hard to get things done when you feel low about yourself. She might not have the confidence or self belief that she can improve at the moment and think it is pointless. This can be solved by surrounding herself with positive people such as good friends and work-mates/family. She could also go to a counsellor to improve her confidence.

Mark scheme and examiners' report
Question 4:
Learners achieving the highest marks were able to interpret the information provided throughout the paper and recommend three appropriate and considered actions for improving health and wellbeing and describe suitable sources of support with convincing explanations given for how the suggested support will help achieve the targets.
Question 5:
Learners achieving the highest marks were able to synthesize all the information from the start to the end of the paper. They provided a rationale for their plan that clearly demonstrated how their plan met the need to improve specific elements of his health and wellbeing for the avoidance of specific physical and emotional health issues and/or social wellbeing issues. They demonstrated a sound understanding of his various circumstances, whilst acknowledging his wishes in making a person-centred plan. Learners achieving the highest marks were able to do this comprehensively and concisely.
Question 6:
Learners achieving the highest marks described obstacles that were particular to their plan and to their circumstances, linking to information the learner had gained throughout the paper. The suggestions made by these learners for minimising the obstacles were realistic.

COMPONENT 1 BTEC TECH PERFORMING ARTS (ACTING)

LEARNING AIM A

A write up consisting of the following criteria for **EACH** of the plays:

- Key characteristics
- Creative intentions and purpose (purpose of the play, target audience, themes, how themes are communicated in the play, context of play (political, social, historical)
- Synopsis of play
- Initial reactions after watching the play Production elements
- Link opinions and theories together with justifications as to why the director/writer/actor may have made particular choices

Roles and responsibilities of an actor/director/various designers **THEN** specific roles and responsibilities of an actor/director/designer that are tailor made for **EACH** of the plays

LEARNING AIM B

1) The processes, techniques and approaches used by practitioners

1 –Participate in workshop rehearsals in the style of each company
2 – Recreate short snippets from the play using these techniques
3 - Reflect on the roles and responsibilities of an actor and director from these workshops
4- Research the rehearsal time line of each play (**from page to stage**)

2) The interrelationships between constituent features

Interrelationships – the way in which two or more things are linked together
Constituent features - e.g. the script, performers involved, techniques used in performance and design (e.g. lighting, sound set) relationship between performer and audience etc

Play: Things I know to be true
Company: Frantic Assembly
Genre: Physical theatre
Rehearsal techniques:
Speech - exercises building trust between company
Hymns hands – placing hands on yourself and partner to create a sequence/story
Round/by/through – using your body to go round your partner, through a part of them or stand/lean by them
Chair duet – bring 2 techniques together to create a story
Flying – lifting technique

Play: One Man, Two Guvnors
Company: National Theatre
Genre: Commedia dell'arte
Voice and Speech - Often very fast dialogue
Exaggeration – Exaggerated gestures, arm and leg movements.
Timing – Fast-paced action and Exemplary comic timing
Whole body engagement – using every part of the body to tell the story
Diversity – Many individual characters have specific acting techniques unique to their character
Slap Stick – Slapstick an essential ingredient, particularly for servant characters.

Play: Wonder.Land
Company: National Theatre
Genre: Musical Theatre
Rehearsal techniques:
Movement – story its self contained in short episodes of movement
Singing –Acting the song ATS is to convey appropriate emotion through singing
Multi-role play – playing more than one character
Action songs -which move the plot forward
Voice – A range of different vocal techniques used to warm up the voice.

COMPONENT 2 BTEC TECH PERFORMING ARTS (ACTING)

Learning Aim A - To develop skills and techniques for performance

Skills workshops that will teach techniques needed to explore and create short extracts of a play.

Learning Aim B - To apply skills and techniques in rehearsal and performance

Learn 5-15 minutes of script from Shakers or Bouncers and perform to an audience.

Learning Aim C – To review own development and performance

Provide a logbook which evidences your progress from first workshops through to performance of script. This will include strengths, targets and reviews.

Evidence needed: teacher observations, recordings of workshops, peer observations, target setting, logbooks.

Monologues

1. **If you get to select your monologue, choose one you really like.**

Pick a monologue that you really like. You'll be more eager to work on the monologue and practice it if you love the piece you're performing

2. Break down the monologue.

Monologues can be intimidating because they are a huge chunk of text on a page. Breaking them down into smaller chunks can help you memorize the lines and really understand what the character says or feels.

3. Get memorization out of the way early.

Memorizing lines is just the tip of the iceberg. It is even better to get your lines memorized (accurately!) as quickly as possible. This will help alleviate stress when you go to perform. You'll be able to focus on your character and movements instead of struggling to remember the next word. you can improve on. Then, try again!

Skills workshops to include:

Vocal warm up, Physical warm up, Tableaux, Freeze frames, Thought tracking/tunnel, Hot seating, Multi-role playing, Rhythm-Pace-Tempo, Choral work, Movement and Gesture

Key vocabulary

Naturalism – a style of performance where actors and designers try to create the illusion that what is happening on stage is 'reality'
Epic Theatre – Political theatre created by Brecht
Levels - the height you perform a movement – low, medium or high.
Proxemics - distance between characters to show a relationship
Improvisation – performing in an unrehearsed and spontaneous way
Characterisation - creating a character through your movement and dynamic choices
Stereotype-
Use of voice – adapting your voice to suit a character requirement. Volume, tone, pitch pace, intonation
Tableaux - a silent and motionless depiction of a scene created by actors (plural)
Hot seating – an in-depth questioning of a character
Though tracking – internal thoughts of a character spoken aloud
Thought tunnel – inner thoughts of a character considering moral decisions
Stage fighting – rehearsed and realistically represented fight sequence
Multi-role playing – an actor plays multiple characters
Rehearsal – a practice of the play
Blocking – deciding where an actor should stand during a scene
Colloquial language – words used in everyday language that are time specific (e.g. "current")

COMPONENT 3 BTEC TECH PERFORMING ARTS (ACTING)

Devise a performance in response to a stimulus provided by the exam board. Both parts of the task (written and performance) will be completed under supervision. There is a 12 week window for all parts to be completed. The component is marked out of 60.

Assessment objectives

AO1 - Understand how to respond to a brief. Discuss and practically **EXPLORE** the stimulus considering: target audience, performance space, planning and managing resources, running time and style of work.
Develop ideas considering: structure of work, style and genre used, skills required, creative intentions.
Work effectively as a member of the group making an individual contribution and responding to the contribution of others.

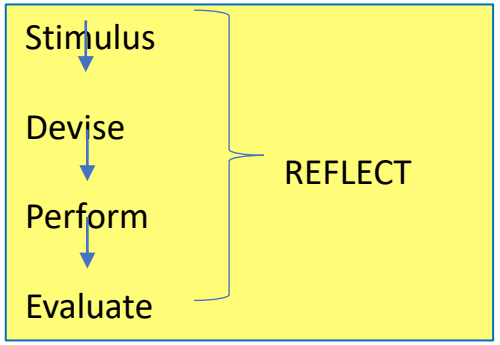
AO2 – Select and develop skills and techniques in response to a brief. Demonstrate **HOW** to select and develop skills and techniques that are needed for the performer and whole group and take part in the rehearsal process.

AO3 – Apply skills and techniques in a workshop performance in response to a brief
Contribute to a workshop performance using: vocal, physical and interpretative skills. (18 marks)
This performance will last

AO4 – **Evaluate the development process and outcome in response to a brief**
Evaluate the process and performance. Consider: the brief, stimulus and contribution from other group members. Reflect on: selection of skills used, individual strengths/areas for improvement, overall and individual contribution to the group, impact of the groups work.

Key vocabulary

Target audience – who you will perform to and why
Performance space – choosing where the performance will take place if not on the stage and why
Running time – length of the performance
Style of work – genre or practitioner who will influence your work
Vocal skills – ability to adapt voice to suit a character
Physical skills – movement, gestures, body language, facial expressions
Interpretative skills – presenting yourself to the audience and creating emotion
Commitment –how much effort you put in individually and as a group
Rehearsal – practicing the performance
Blocking – deciding where an actor should stand
Performance – Showing of the piece of work to the target audience
Evaluate – identify strengths and areas for improvement of both the rehearsal and performance
Characterisation - creating a character through your movement and dynamic choices



Year 11 PSHE Term 2 – Relationships and sex education and Health and Wellbeing

Language for Learning

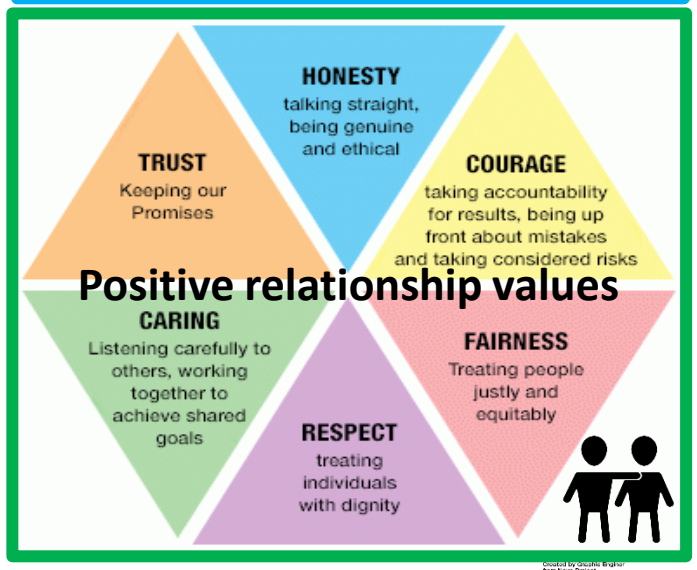
Values
Emotions
Gender
Sexuality
Assertive communication consent
Contraception
Sexual health
Exploitation
Support
Risk
Safety
First aid
Lifestyle choices
Screening and self-examination
Vaccinations/ immunisation
Blood, organ and STEM cell donation.
Families
Marriage
Change
Loss
Bereavement.

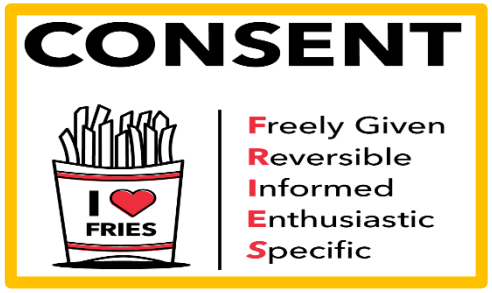
Personal Values are "broad desirable goals that motivate people's actions and serve as guiding principles in their lives. **Personal values** are desirable to an individual and represent what is important to someone. Examples include:

- Honesty
- Trust
- Justice
- Love

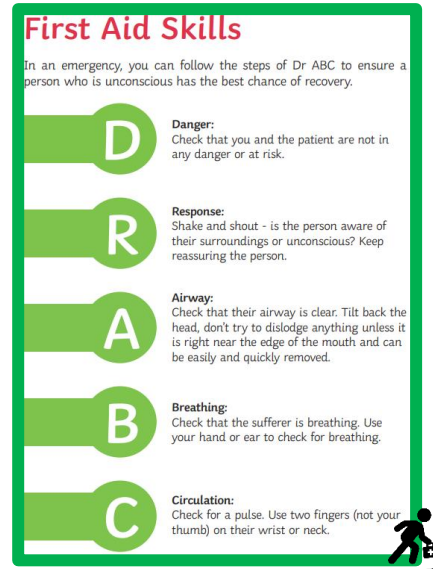
Christian values that will be embedded in PSHE lessons:

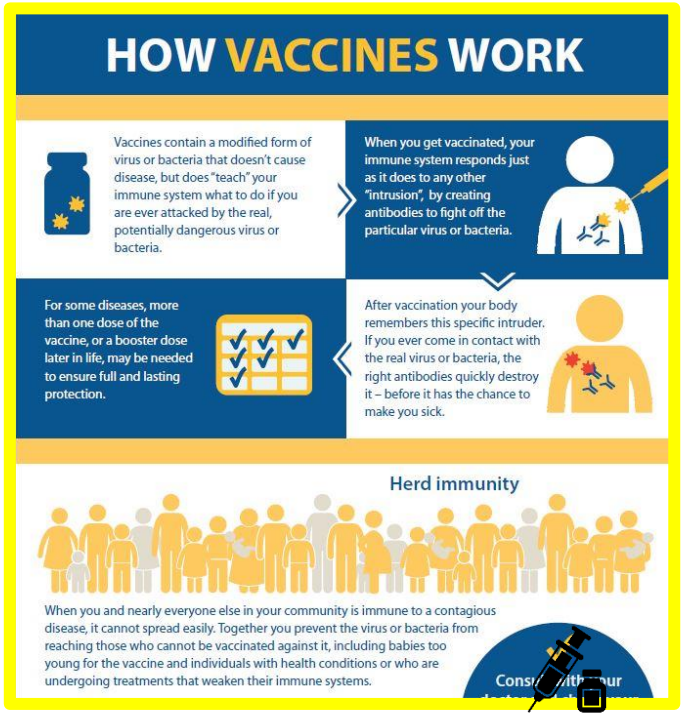
Compassion, Forgiveness, Friendship, Hope, Humility, Justice, Love, Peace, Thankfulness, Trust, Wisdom, Endurance

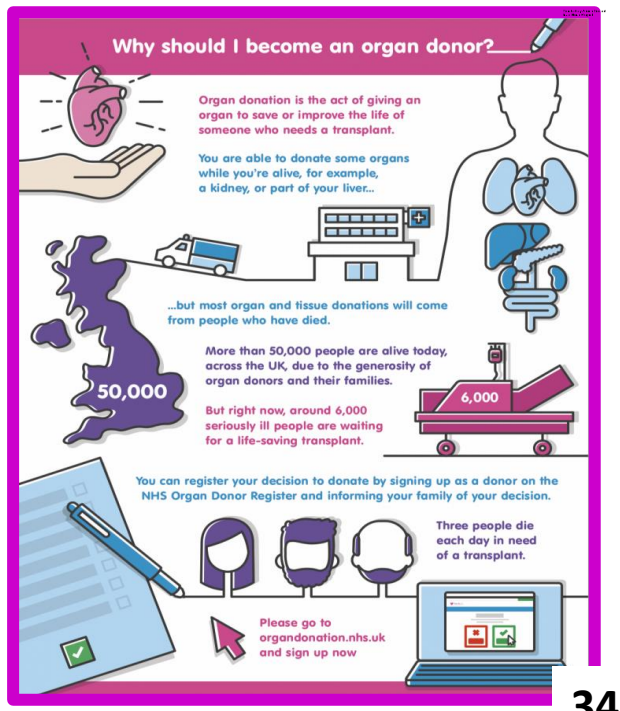




brook ChildLine 0800 1111







Knowledge Organiser

Unit 2 BTEC Sport Level 2

Practical Sports Performance

Pearson BTEC

Key Terms

Performance
Rule
Law
Regulation
Roles
Responsibility
Participation
Officials
Scoring
Checklist
Criteria
Evaluation
Feedback

Participation in sport

Participation in sport continues to grow, as people become more aware of the benefits of physical activity. Engaging young people through sport is a key political agenda, both because current national health statistics show that obesity in young children is rapidly increasing and also because we strive for excellence and success at major sporting events .

Sport is an activity involving physical exertion and skill in which an individual or team competes against another or others for entertainment. Physical Activity simply means movement of the body that uses energy. Walking, running, climbing the stairs, playing football , or dancing are all good examples of being active. For health benefits, physical activity should be moderate or vigorous intensity. This means getting the heart and lungs working.

Scoring Systems

All sports have a scorning system and often if you can get a better score than your opponent you will win. Scoring if often done by officials.

E.G referee, umpire, and judges.

Review performance

- Strengths and areas for improvement: components of fitness, skills and techniques, specific to the sport and non-specific, e.g. fitness.
- Self-analysis: completion of observation checklist, e.g. use of video.
- Strengths and areas for improvement: tactics, the effectiveness of decision making.
- Activities to improve performance (**short-term and long-term goals**): e.g. training programmes, use of technology, attending courses, where to seek help and advice.






Rules (or laws)

Rules (or laws) as regulated by the national or international governing body for the sport. For example, the Fédération Internationale de Football Association (FIFA) laws of football, the International Rugby Board (IRB) laws of rugby, the Badminton World Federation (BWF) rules of badminton, and the International Orienteering Federation(IOF) rules of orienteering. Rules keep everyone safe and make sure the game or sport is done fairly.

Rule example :
In Football you cant touch the ball with your hand during play.




Roles of officials

For example, the roles of umpires, referees, referees' assistants, judges, timekeeper,
starters, table officials, third umpire, fourth official.

Responsibilities of officials

For example, appearance, equipment, fitness, qualifications, interpretation and application of rules, control of players, accountability to spectators, health and safety(equipment, facilities, players), fair play, use of technology, effective communication(voice, whistle, signals).



Regulations

For example, relating to players and participants, equipment, playing surface, facilities,
health and safety, time, officials (referee, umpire, judge, starter, timekeeper. For example all Netball players should be wearing the correct kit on court. This kit should be specified before a game so that the opposition has a contrasting kit and they wont clash or get confused. In addition all players should remove jewellery. Plus play in the correct footwear, this is also the same for football.

Safe and appropriate participation

The demonstration of skills, techniques and tactics within a controlled environment, for example no competition, drills, set plays.

Adhere to 'rules', health and safety guidelines, and consider appropriate risk
management strategies in physical activity and sport.

Top Tips

1. Wear protective gear, such as helmets, protective pads, and gum shields.
2. Warm up and cool down.
3. Know the rules of the game.
4. Watch out for others.
5. Don't play when you're injured

Relevant Tactics

The tactics relevant to the selected sport and practice/situation. Or specific tactic for specific sports.

Strategies and tactics

Are often pre-arranged and rehearsed, especially in team games. Performers also need to be able to adapt or change them during a performance. This requires good problem-solving and decision-making skills. Good observation and tactical awareness are important while both playing and analysing play.

For example taking a fast centre pass in ball or double marking an attacking player.

Key Works Unit 2

Participation:- To take part in a sports or activity. You can have high and low levels of participation.

Performance:-Sports performance is the manner in which sport participation is measured. Sport performance is a complex mixture of skills training and techniques.

Fitness:- Is being physically fit and healthy. Adults and children can have different levels of fitness. Fitness is something that you can improve.

Observation:- A observation is the process of closely observing or monitoring something or someone. For example watching a specific player in football and making specific notes.

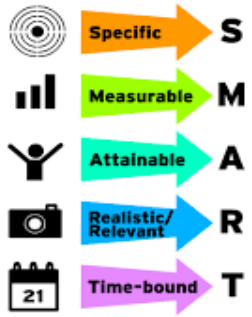
Techniques:- A technique is the method ,technique that procedure a way something is done. An example of techniques being your knees when taking a set shot.

Self –Analysis:- Is where you would review your own performance to understand his or her own personality/performance without the aid of another person.

Governing Body:- A governing body is a an organisation that governs and administers a sport . For example the FA or England Hockey or swim England.

NHS:- National Health Service. It refers to the Government-funded medical and health care services that everyone living in the UK can use for FREE!

Goal setting



Short Term

*

Long term

Observation checklist

For example, to review performance in selected sports using video analysis:

- components of physical fitness
- technical demands of sport (skills and techniques)
- production of a checklist suitable for self-analysis of performance in selected sports
- tactical demands of sport

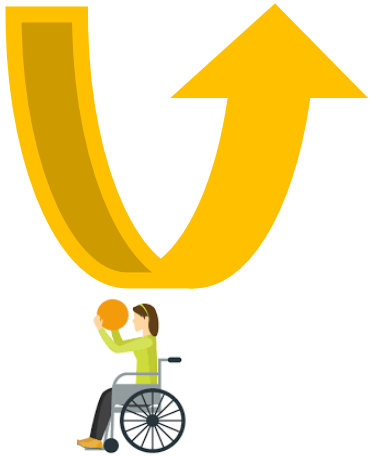
Observation Checklist		Comments:-
Defence		
Speed		
Aerobic Endurance		

Isolated Practices

For example, skills and techniques demonstrated independently without any pressure or external forces, completed successfully and without fault.

Conditioned practices

For example, small-sided games, a limited number of touches, a set number of defenders or attackers.



Competitive situations

- Full-sided games.
- Appropriate opposition
- With match officials.
- Personal performance that contributes to relevant use of skills, techniques and tactics in relation to:

1. communication
2. Individual role
3. responding to team mates and/or opposition.

Effective use of skills and techniques.

For example: rugby conversion, including head position, body position, placement of non-kicking foot, placement of kicking foot, connection with the ball.

Technique is so important for all sports and its important that you break it down into specific parts.

Components of Physical Fitness

Aerobic endurance: (the ability of the cardiorespiratory system to work efficiently, supplying nutrients and oxygen to working muscles during sustained physical activity)

Muscular endurance: (the ability of the muscular system to work efficiently, where a muscle can continue contracting over a period of time against a light to moderate fixed resistance load)

Flexibility: (having an adequate range of motion in all joints of the body; the ability to move a joint fluidly through its complete range of movement)

Speed: (distance divided by the time taken. Speed is measured in metres per second (m/s). The faster an athlete runs over a given distance, the greater their speed)

Muscular strength: (the maximum force (in kg or N) that can be generated by a muscle or muscle group)

Body composition: (the relative ratio of fat mass to fat-free mass (vital organs, muscle, bone) in the body)

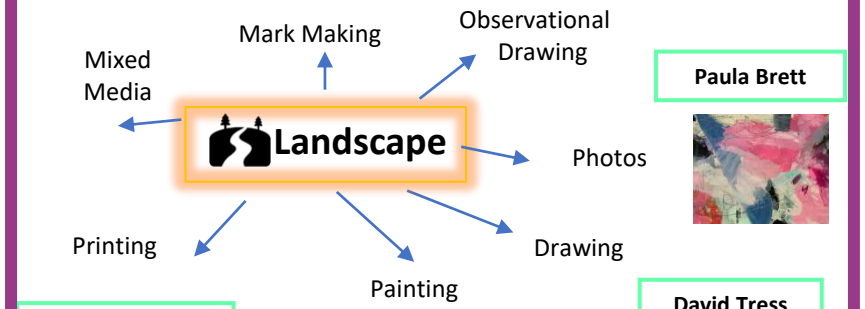
The application of the components of fitness to a chosen sport.

Example :- Football requires foot speed and muscular strength to allow the player to reach the ball before their opponent and hold them off the ball to keep possession. For example, long distance running requires good aerobic endurance to supply oxygen and nutrients to working muscles during a race as well as a low body composition to ensure fat mass is low so that the distance can be covered more easily.

KS4 ART – Knowledge Organiser: PORTFOLIO DEVELOPMENT – Landscape mixed media)

Language for Learning:

Continuous Line
Silhouette
Layers
Merge
Expressive
Creative
Proportion
Message
Tone
Stencil
Collage
Powerful
Expressive
Mixed media
Refine



AIM: To refine all portfolio work and add a final project to include a final piece.

GCSE ART EXAM – UNIT 2

AQA Externally set questions given to students

AIM: To develop a set of artist research sheets showing an understanding of the techniques and media used. To include elements of AO2 and AO3 through careful composition and creative presentation……This will also from part of your portfolio.

CONTEXTUAL STUDIES CONT'D

Work from artists covered in your contextual studies booklet will be included as part of your final portfolio. You will be selective when deciding which artists you will research and where possible, find links between their work and your own.

PORTFOLIO PRESENTATION….is key!

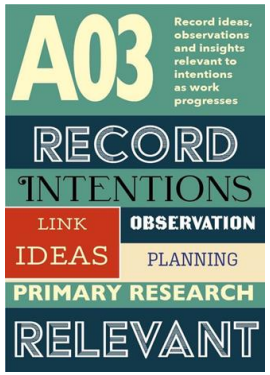
Questions to consider……

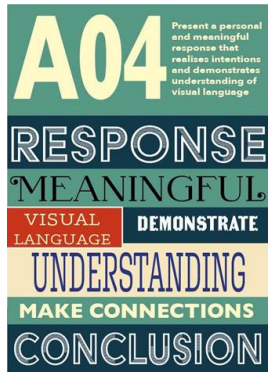
How	Can I create my own version of the artists' work? Can I express my own personality and opinions visually?
Explain how	You have developed your ideas. What techniques and media you have used and why these are appropriate to your personal journey.
What	Makes the artist' work successful. Have you used the same/similar media in a way that demonstrates the same success?
Which	Of the experiments you have chosen to develop further show the most effective used of media?
Explain	Who and what has inspired your ideas. Talk about your decisions and explain how you have modified your work.
Why	Did you select your theme and artists and why is the media you have used appropriate to the theme(s)?
What	Are the main characteristics of each artists work and what are their strengths?

How will you select and present your portfolio in a way that will showcase it best?

KS4 ART – Knowledge Organiser: PORTFOLIO DEVELOPMENT – Landscape mixed media)

There are 4 assessment objectives in GCSE Art:





All 4 Assessment Objectives must all be covered in depth to achieve your potential.

To summarise:

AO1: Artist research and inspiration.

AO2: develop and refining experiments successful techniques.

AO3: Recording observations-taking lots of photographs and making notes

AO4 Making final outcome/s or response.

YOUR PORTFOLIO IS YOUR COURSEWORK. THIS IS 60% OF YOUR FINAL GRADE
YOUR EXAM IS 40% OF YOUR FINAL GRADE

THE EXAM PAPERS ARE DISTRIBUTED IN JANUARY 2021. EXAM PREPARARTION STARTS IMMEDIATELY AFTER THIS!

Sentence starter for annotation:

- I am interested in the work of ……due to their use of…….
- I am intrigued by the artist ……their use of ……..creates an aesthetically pleasing outcome.
- The artist ……links well to my subject matter due to the way they……I intend to develop this characteristic in my own work by experimenting with ……
- I aim to use the characteristics of……within my work, to do this I am going to develop……

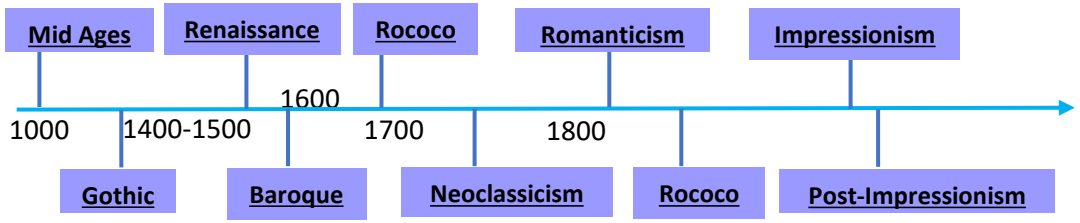
EXTENDED LEARNING

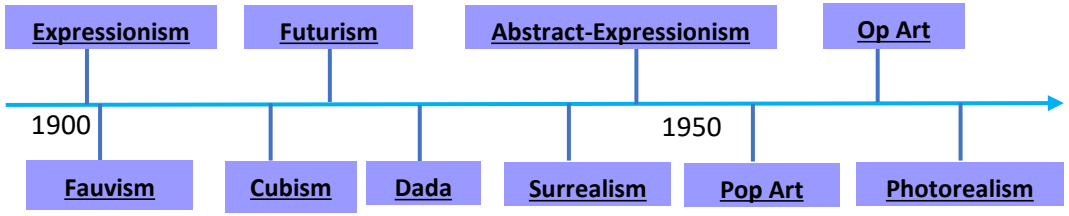
Anything that appeals to you creatively is acceptable to include in your portfolio. For example, if you use Pinterest and you see an image or project that appeals to you then have a go. There are many online exhibitions you can view and galleries you can follow which may also inspire you! Remember, your artwork can be anything – there is no right or wrong as long as you can show evidence of the assessment objectives through your work. Here is a list of galleries and exhibitions you may want to look and and some more artists who have been popular with our students over recent years…….

freeartfridaymcr
manchestercraft
thelowry
Homemcr
mcrartgalery
Whitworthart
yspsculpture

frieze_magazine
friezeartfair
artnet
saachi_gallery
artforum
tate
Themuseumofmodernart

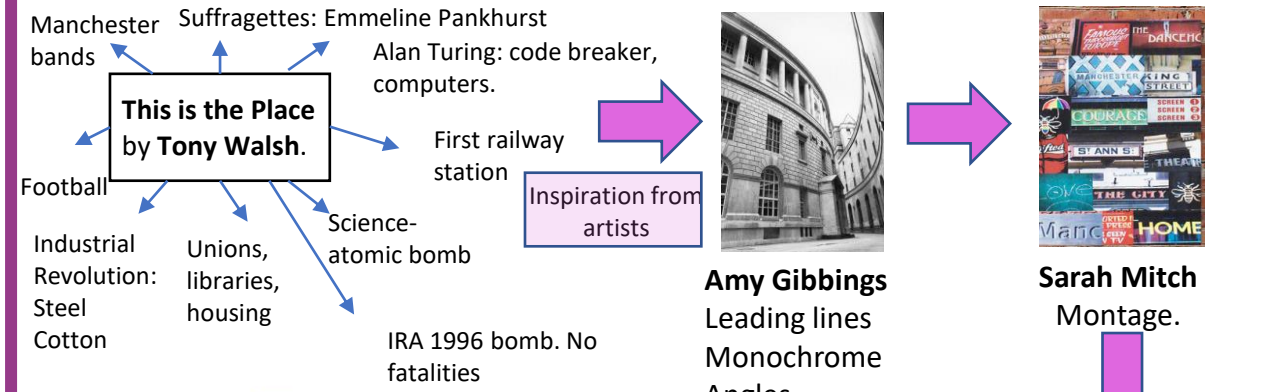
TIMELINE





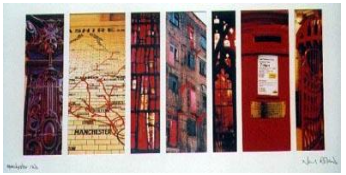
KS4 Photography GCSE – Topic 5: Manchester: This is The Place. Knowledge Organiser

Language for Learning:
Aesthetics
Aesthetically
Alan Turing
Argh Kid
Amy Gibbings
Analogue camera
Characteristics
Commission
Composition
Contrasting
Darkroom
Develop
Digital
Emmeline Pankhurst
Evoke
Hexagon
Hive
Honeycomb structure
Focus
Imagery
Industrial Revolution
Inspiration
Inspired
IRA
James Wakefield
Mancunian
Mauren Brodbeck
Montage
Neil Roland
Ryan Williams
Sarah Mitch
Sasha Ray
Similarities
Subject Matter
Suffragettes
Tony Walsh



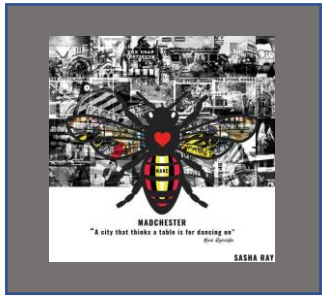
Amy Gibbings
Leading lines
Monochrome
Angles.

Sarah Mitch
Montage.



Neil Roland
Montage.

Mauren Brodbeck
Layering and transparency.



Sasha Ray
Layering images and text.

Developing own edits and refine.

Final edit/s

AIM: To create edits which evoke pride in Mancunians.

Questions to consider……

How	will we illustrate the poem This is the Place through Photography? Look at the main points surrounding the title of the poem- how will we illustrate these?
Explain how	You will ensure your edit/s will make strong visual links to the work of the artist.
What	could make your compositions even more successful? Does the hive/honeycomb feature? Have you chosen an evocative phrase from the poem to add to your edit?
Which	characteristics have you taken from the artist to influence you in this edit?
Explain	which lines of the poem indicate the: industrial revolution/how the city is at the heart of innovation/ resilience of the people.
Why	Is Emmeline Pankhurst/Alan Turing an important figure to Manchester?
What	Are the main characteristics of each artists work?

Which factors link to today's learning?
Social / historic/ political / artistic influence/ technical skills…

How does this learning link to the big picture?

Who are the key artists?

KS4 Photography– Topic 5: Manchester-This is the Place Preparing you for GCSE Style Exam

There are 4 assessment objectives in GCSE Photography:

All 4 Assessment Objectives must all be covered in depth to achieve your potential.

To summarise:
AO1: Artist research and inspiration.
AO2: develop and refining both photoshoots and editing.
AO3: Recording observations-taking lots of photographs and making notes
AO4 Making final outcome/s or response.

Sentence starter for annotation:

- I am interested in the work of ……due to their use of……
- I am intrigued by the artist ……their use of ……creates an aesthetically pleasing outcome.
- The artist ……links well to my subject matter due to the way they……I intend to develop this characteristic in my own work by experimenting with ……
- I aim to use the characteristics of……within my work, to do this I am going to develop……

Photoshop Tools


Move tool


Rectangular Marquee tool


Polygonal Lasso tool


Quick selection tool- sees Shape


Magic Wand- sees colour


Crop


Eye dropper- selects colour


Spot healing brush


Healing brush

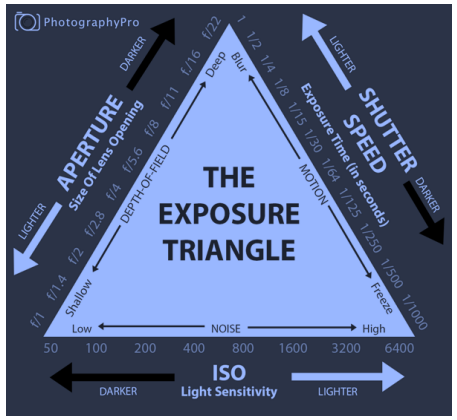

Brush tool


Gradient tool

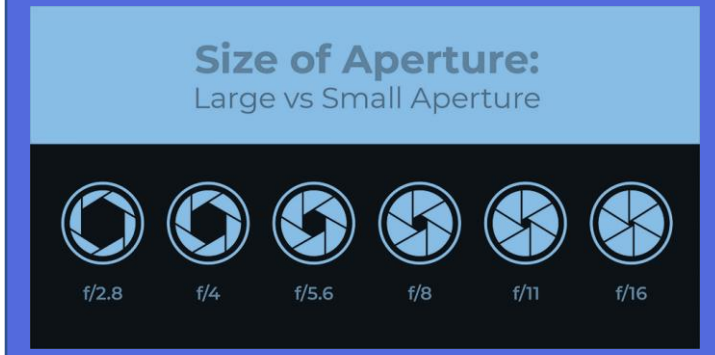

Eraser tool


Pencil tool

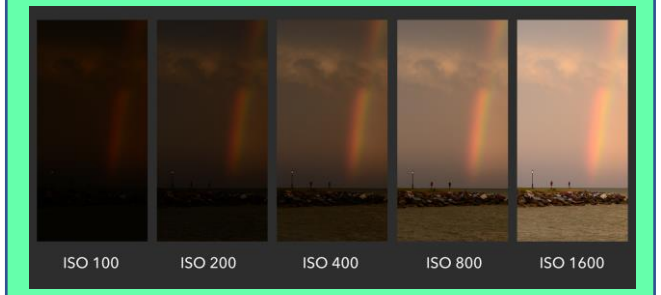
- ISO
- Aperture
- Shutter speed



Aperture can be defined as the opening in a lens through which light passes to enter the **camera**. It is expressed in f-numbers like f/1.4, f/2, f/2.8 and so on to express the size of the lens opening.

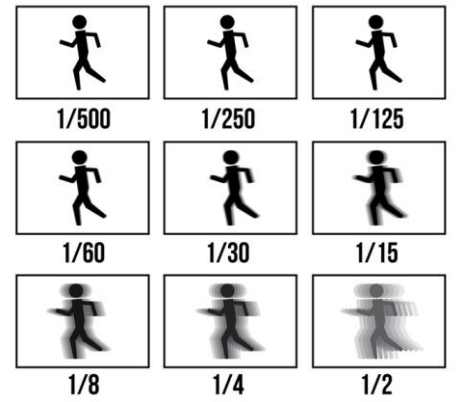


Camera settings



ISO is simply a camera setting that will brighten or darken a photo.

The higher the ISO setting, the less amount of light needed to achieve the correct exposure.
The lower the ISO setting, more light is needed to achieve correct exposure.



The **shutter speed**, is just how long that barrier stays open to let light into the image.

Shutter speed is how long an image is exposed to light — it can be milliseconds, or even minutes.

KS4 – WJEC Hospitality and Catering – Unit 2 1.1 Nutrients Required by the Body Knowledge Organiser.

Language for learning:
HBV proteins
LBV proteins
Fat soluble
Saturated
Unsaturated
Simple carbohydrates
Complex carbohydrates
Reference intake (RI)
Fibre (NSP)
Diabetes
Allergies
Gluten Intolerance
Coeliac Disease
Lactose Intolerance
High Cholesterol
Coronary Heart Disease
Vegetarianism
Pescetarian
Ovo-vegetarian
Lacto-vegetarian
Vegan
RNI (Reference nutrient intake)
Calories
Bones
Teeth
Anaemia
Calcium
Retinol

AC1.1 – Nutrients.
You need to write about:
- Protein.
- Carbohydrates.
- Fats – saturated and unsaturated
- Vitamins A, B, C and D.
- Minerals – Sodium, iron and calcium.
- Water
- Fibre

For each nutrient – why do we need them, what foods are they found in, what happens if you have too much, or not enough?

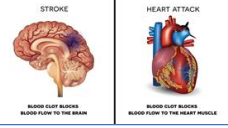
Carbohydrates

Carbohydrate is the body's main source of energy (fuel). Carbohydrate breaks down to glucose, which is the only form of energy the brain recognizes.
Basically, without carbohydrate, your brain wouldn't function!

There are 2 different types of carbohydrate: Sugary and Starchy.

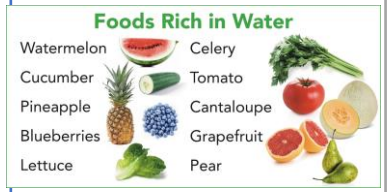

Starchy carbohydrates are better for us because they provide energy for longer and not just a quick sugar rush. Sugary carbohydrates can lead to rotting teeth and obesity. Being obese can lead to strokes and heart attacks.

It is important that when you eat carbohydrates, you burn off the energy it provides. If you eat a lot of carbohydrates and don't use the energy, then you start to put weight on

Water

Water makes up just over 2/3 of the human body
and is required for:
- Maintain body temperature
- Metabolise fat
- Aid digestion
- Lubricate organs
- Transport nutrients
- Flushes out waste and toxins



Fibre

Fibre (NSP)
Non-Starch Polysaccharide

Food also provides fibre.

- Fibre **does not provide** the body with **energy**, but is needed to fulfil some important 'support' **functions** for the body.
- Fibre aids digestion by supporting the **removal of waste products** from the body.
- This decreases the amount of toxins in the body and can prevent bowel and colon cancers.

Fats

Fat is needed in the body for several reasons:
- **Protection** of internal organs.
- **Thermoregulation** (temperature control).
- **Insulation** of nerve cells (conduct electrical messages)
- Uptake of fat soluble vitamins **(A, D, E & K).**
- **Growth, development and repair** of body tissues.
- In women, storage and modification of **reproductive hormones** (oestrogen).
- **Flavour** - fat in food improves 'mouth feel' takes longer to digest 'satiety value'.
- **'Grease'** food to make it easier to swallow.
- **Essential fatty acids** – Omega 3 and 6.

Classification of Fats

Classification	Characteristics	Sources
Saturated Fats (bad)	• Mainly from animal sources. • Solid at room temperature. • With the exception of palm and coconut oil.	Meat, Butter, Cream, Eggs
Polyunsaturated Fats	• Mainly from non-animal sources and liquid at room temperature.	Vegetable oil, Corn oil, Safflower oil, Nuts, Oily fish
Monounsaturated Fats	• Liquid at room temperature. • Will slightly solidify at cool temperatures.	Avocado, Many nuts and seeds, Olive oil, Rapeseed oil, Almond oil, Sunflower oil
Essential Fatty Acids Omega 3 and 6	• Found in unsaturated fats. • Omega 3 found in far fewer foods than Omega 6.	Oily fish, Seeds and oils, Flax seeds, Pumpkin seeds, Walnuts, Soya beans, Dark green vegetables, Vegetable oils, Margarines (polyunsaturated)
Trans Fatty Acids (Hydrogenated) Terrible!	• Not naturally occurring fats • Produced via process called 'hydrogenation'. • Converts liquid fats to solid fats.	

Protein

Protein is essential for the growth, maintenance and repair of body tissue. Protein is part of every living cell and some tissues like skin, muscle, hair and the core of bones and teeth!

Proteins are made up of amino acids of which there are:

9 essential
Body cannot manufacture (make) these.
Must be provided by our diet.
High Biological Value
Animal sources of protein, such as meat, poultry, fish, eggs, milk, cheese and yogurt.

12 non-essential
Can be made by the body.
Low Biological Value
Plants, legumes, grains, nuts, seeds and vegetables.

A vegan diet contains only plants, such as vegetables, grains, nuts and fruits, and foods made from plants. Vegans don't eat foods that come from animals, including dairy products and eggs.

A healthy vegan diet contains:
- plenty of fruit and vegetables
- plenty of starchy foods
- some non-dairy sources of protein, such as beans and pulses
- some dairy alternatives, such as fortified soya drinks
- just a small amount of fatty and sugary foods

For vegetarians who eat dairy products and eggs, a healthy diet is the same as for anyone else but without meat or fish.

A healthy vegetarian diet contains plenty of fruit and vegetables and starchy foods, some non-dairy sources of protein such as eggs and beans, some dairy products and just a small amount of fatty and sugary foods.

KS4 – WJEC Hospitality and Catering – Unit 2 1.1 Nutrients Required by the Body Knowledge Organiser.

Vitamin D

Vitamin D helps regulate the amount of calcium and phosphate in the body.

These nutrients are needed to keep bones, teeth and muscles healthy.

A lack of vitamin D can lead to bone deformities such as rickets in children, and bone pain caused by a condition called osteomalacia in adults.

Good sources of vitamin D:

- oily fish – such as salmon, sardines, herring, mackerel, fresh tuna
- red meat, liver
- egg yolks
- fortified foods – such as most fat spreads and some breakfast cereals

How much vitamin D do I need?

Babies up to the age of one year need 8.5-10mcg of vitamin D a day.

Children from the age of one year and adults need 10mcg of vitamin D a day. This includes pregnant and breastfeeding women, and people at risk of vitamin D deficiency.

Vitamin C – Ascorbic acid

These include:

- helping to protect cells and keeps them healthy
- maintaining healthy skin, blood vessels, bones and cartilage
- helping with wound healing

Lack of vitamin C can lead to scurvy. Mild deficiencies may occur in infants given unsupplemented cows' milk and in people with poor or very restricted diets.

Good sources of vitamin C:

- oranges and orange juice
- red and green peppers
- strawberries
- blackcurrants
- broccoli
- brussels sprouts
- potatoes

Vitamin C can't be stored in the body, so you need it in your diet every day.

What happens if I take too much vitamin C?

Taking large amounts (more than 1,000mg per day) of vitamin C can cause:

- **stomach pain, diarrhea, flatulance**

These symptoms should disappear once you stop taking vitamin C supplements.

Vitamin A

Vitamin A, also known as retinol, has several important functions.

These include:

- helping your body's natural defense against illness and infection (the immune system) work properly
- helping vision in dim light
- keeping skin and the lining of some parts of the body, such as the nose, healthy

Good sources of vitamin A include:

•Cheese, eggs, oily fish

•fortified low-fat spreads

•milk and yoghurt

•liver and liver products such as liver pâté – **this is a particularly rich source of vitamin A, so you may be at risk of having too much vitamin A if you have it more than once a week (this is particularly important if you're pregnant)**

Thiamin (vitamin B1)

Thiamin, also known as vitamin B1, helps:

- **break down and release energy from food**
- **keep the nervous system healthy**

Good sources of thiamin:

- **peas**
- **fresh and dried fruit**
- **eggs**
- **wholegrain breads**
- **some fortified breakfast cereals**
- **liver**

Vitamin B12

Vitamin B12 is involved in:

- **making red blood cells and keeping the nervous system healthy**
- **releasing energy from food**
- **using folic acid**

A lack of vitamin B12 could lead to vitamin B12 deficiency anaemia

Good sources of vitamin B12:

- **Meat, salmon, cod**
- **Milk, cheese, eggs**
- **some fortified breakfast cereals**

Minerals - Calcium

Calcium has several important functions.

These include:

- helping build strong bones and teeth
- regulating muscle contractions, including heartbeat
- making sure blood clots normally

A lack of calcium could lead to a condition called rickets in children and osteomalacia or osteoporosis in later life.

- Too much can lead to stomach ache and diahorrea.

Sources of calcium include:

- milk, cheese and other dairy foods
- green leafy vegetables – such as broccoli, cabbage and okra, but not spinach
- soya beans
- tofu
- soya drinks with added calcium
- nuts
- bread and anything made with fortified flour
- fish where you eat the bones – such as sardines and pilchards

Minerals – Iron

Iron is important in making red blood cells, which carry oxygen around the body.

A lack of iron can lead to iron deficient anaemia. **Good sources of iron include:**

- liver (but avoid during pregnancy)
- meat
- beans
- nuts
- dried fruit – such as dried apricots
- wholegrains – such as brown rice
- fortified breakfast cereals
- soybean flour
- most dark-green leafy vegetables – such as watercress and curly

Women who lose a lot of blood during their monthly period are at higher risk of iron deficiency anaemia and may need to take iron supplements.

What happens if I take too much iron?

Side effects of taking high doses (over 20mg) of iron include: constipation, feeling sick, vomiting, stomach pain. Very high doses of iron can be **fatal**, particularly if taken by children, so always keep iron supplements out of the reach of children.

Salt

Many of us in the UK eat too much salt. Too much salt can raise your blood pressure, which puts you at increased risk of health problems such as heart disease and stroke.

You don't have to add salt to food to be eating too much – 75% of the salt we eat is already in **everyday foods such as bread, breakfast cereal and ready meals.**

How much salt for adults?

Adults should eat no more than 6g of salt a day – that's around one teaspoon. Children should eat less:

- 1 to 3 years – 2g salt a day (0.8g sodium)
- 4 to 6 years – 3g salt a day (1.2g sodium)
- 7 to 10 years – 5g salt a day (2g sodium)
- 11 years and over – 6g salt a day (2.4g sodium)

KS4 – WJEC Hospitality and Catering – Unit 2 1.1 Nutrients Required by the Body Knowledge Organiser.

Reference Intake

The NHS recommends the following intake of each nutrient per day:

Vitamin A	0.7mcg	0.6mcg
Vitamin D	10mcg	
Vitamin E	4mg	3mg
Vitamin K	1mcg per kg of body weight	
Vitamin B	Thiamin: 1mg Riboflavin: 1.3mg Vitamin B12: 1.5mcg	Thiamin: 0.8mg Riboflavin: 1.1mg Vitamin B12: 1.5mcg
Vitamin C	40mg	
Sodium (Salt)	Less than 6g	
Iron	All (M) 8.7mg	(F) 19-50yrs 14.8mg / 50yrs+ 8.7mg
Calcium	700mg	

Water soluble vitamins

C Antioxidant	Normal structure and function of connective tissue Antioxidant (protects from free radicals) Helps absorb iron	Main sources from plants – fruits and vegetables. Milk and liver contain small amounts.	Scurvy
B1 Thiamin	Normal function of the nervous system and heart	Whole grains, meat, flour and breakfast cereals.	Beri-beri (disorder of the nervous system).
B2 Riboflavin	Release of energy from food	Milk, eggs, green vegetables.	Dry cracked skin around the mouth and nose.
B12	Cell division and blood formation Normal structure of nerves	Animal sources – milk, meat and eggs. Some algae and bacteria can produce B12.	Anaemia (rare), may be found in vegetarians.

Fat soluble vitamins

A Antioxidant	Vision	Dairy Products Dark Green Veg Orange coloured fruit and veg Fish Oils and Liver	Poor vision
D	Bone growth	Fish Oils Dairy Products Sun Light Absorption	Rickets Osteomalacia
E Antioxidant	Protect tissue	Dairy Products Dark Green veg Nuts	Age quickly Wrinkles Skin loses elasticity
K	Blood clotting	Dark Green Veg Fish, liver, fruit	Haemorrhages

KS4 Construction: Briefs, Specifications, Ergonomics and Anthropometrics Knowledge Organiser

Language for Learning:

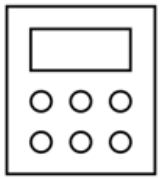
Design Brief
Ergonomics
Anthropometrics
Specifications
Essential Criteria
Desirable Criteria
Size
Aesthetics
Consumer
Function
Quality
Cost
Materials
Safety
Environment
ACCESS FM
Plan
Measurements
Bell Graph
Designer
Science
Interact
Efficiency
Target Audience
Percentile
Products
Project

Ergonomics
Ergonomics are the science of how a user interacts with a product.
Ergonomics are used to make the product fit for the user.
They are used when designing a new product to make sure that it is comfortable and easy to use.

Ergonomics in Practice

- Products need to be designed and made so that their size and proportion fits the needs of the user. Ergonomic design also ensures that the product wont cause any health problems

The buttons on a calculator need to be big enough for a user to press them individually.



Clothes vary in size to fit the user and products such as rucksacks can be adjusted to suit the size of the user.

A chair should prevent you suffering back ache from using the chair regularly.

Anthropometrics
Anthropometrics are the measurements of the human body. These include:

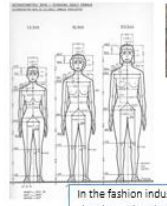
- Arm length
- Head circumference
- Height
- Chest width
- Shoulder height
- Hand width
- Knee Height

These measurements are collected from a wide range of people with different body sizes.
To make products that are the right size and fit for purpose designers need to know the likely body measurements of the intended users.

Most anthropometric data is presented as a bell graph
It's not easy to make products fit 100% of the target audience
Often the top and bottom 5% of people will be excluded
The 50th percentile is the average person or mean value

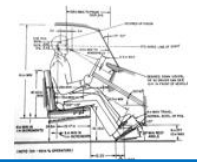
Anthropometrics in Everyday Life

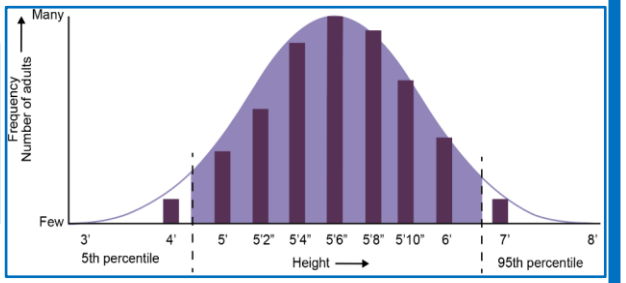
- Anthropometric data is gathered from thousands of people to inform the sizing of many products.
- Manufacturers use this data to produce products that are fit for purpose for the target market.



In the fashion industry anthropometric data is used to draft pattern pieces for different size clothes.

Car manufacturers need to consider anthropometrics when designing the layout of vehicles to make sure it can be operated by the user.





Design Specifications

- A design specification is a list of specific things that should be included in the design of a new product.
- The specification can be split into criteria that are essential and things that are desirable.
- Essential criteria **must** be included in the design.
- Desirable criterial **could** be included.
- The specification becomes a sort of check list for a designer.

A design specification should follow ACCESSFM.

Design Brief

This is the conclusion of all your research and data

- A statement of intent will summarise your design plan:
- What are you going to design?
- Who is the target audience?
- Where are they going to use the product?
- What is the budget?
- When does it need to be completed?
- What size does it need to be?

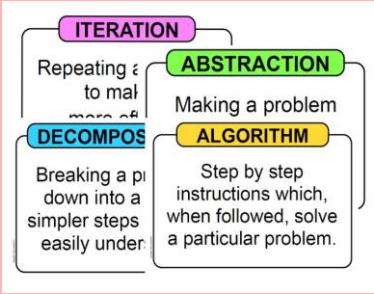
KS4 Computer Science – Year 11 – 2.1 - Algorithms

Language for Learning:

Algorithms

Key Terms:

Algorithm
Abstraction
Decomposition
Algorithmic thinking
Computational thinking
Flowchart
Terminator
Process
Decision
Data
Pseudocode
Instruction
Searching
Binary Search
Linear Search
Merge Sort
Bubble Sort
Insertion Sort
Pseudocode



Key Definitions for Algorithms:

Algorithm: A set of instructions that are all in order to complete a task.
Computational Thinking: Thinking critically and logically when solving a problem. Being able to analytically solve a problem.
Abstraction: Removing the unnecessary parts of a problem so that you only focus on the necessary/important parts.
Decomposition: Breaking a complex problem down into smaller problems so that it is more manageable/easier to solve.
Algorithmic Thinking: The process of building a solution to a problem. Creating a set of instruction in order to solve a problem.
Searching: Algorithm A type of algorithm used to search through a data set to find a specific piece of data.
Binary Search: A type of searching algorithm. In order to use a binary search the data set must be in order.
Linear Search: A type of searching algorithm. The data set does not need to be in order when using a linear search.
Sorting Algorithm: A type of algorithm used to sort a data set into a specific order.
Bubble Sort: A type of algorithm used to sort a data set into a specific order. The data set is passed through, and two pieces of data are looked at in turn. The process does not stop until a pass is completed without moving any data.
Merge Sort: A type of algorithm used to sort a data set into a specific order. The data set it broken up into pairs. Each pair is reorganised in turn. Pairs are then merged together and reorganised. This process is repeated until the whole data set is merged and reorganised.
Insertion Sort: A type of algorithm used to sort a data set into a specific order. A new, temporary list is created, and each piece of data is placed into the correct place in the new list.
Pseudocode: A midpoint between programming syntax and written language. It is not syntax specific therefore can easily be converted to programming code in any language.
Flow Diagrams: A way of representing an algorithm using shapes. All shapes must always connect up creating a flow throughout the diagram.
Terminator: (Flow Diagrams) Used to start and stop a flow diagram.
Process: (Flow Diagrams) Used to give an instruction in a flow diagram.
Decision: (Flow Diagrams) Used to ask a question in a flow diagram. It provides two possible choices (Yes/No).
Data: (Flow Diagrams) Used to show input/output within a flow diagram.

Questions to consider……

Why	What is an algorithm
State	The difference between a binary search and a linear search
Why	Is it not possible to carry out a binary search on the data below: 17,7 ,23 , 4 , 8, 10
State	What an insertion sort is
State	The difference between an insertion sort and a bubble sort

It's your turn!

Using a binary search, locate the number 54 in the below list. You must show your working. [3]

3 10 24 44 54 86 93

VALUES

ASPIRATION I believe that having high aspirations can motivate me to work hard and achieve my goals without excuses. I have high expectations in everything I do. Aspiration is valuable because it allows me to look beyond my current experiences and to understand, interpret and change the world for the better. *"For I know the plans I have for you, declares the Lord, plans to prosper and not to harm you, to give you hope and a future" Jeremiah 29:11*

INTEGRITY I believe that living my life by high moral standards and values is important. I understand how values are grounded in faith and biblical teaching. I commit to doing the right thing in all circumstances, even if this makes things more difficult for me and when no one is watching. I take responsibility for myself and my community to help it improve for everyone. *"Whoever walks in integrity walks securely" Proverbs 10:9a*

RESPECT I believe that mutual respect is the most important element in a kind and cohesive community. Respect, and self-respect, means that I take things seriously. I care about myself and others and aim to do good as I go. Respect is valuable because it allows me to understand the differences in our community and to know how to behave in the best interests of that community.
"Love your neighbour as you love yourself" Matthew 22:39

HARD WORK I believe that through hard work I can overcome challenges as I meet them. I am resilient and want to complete every task to the best of my ability. Hard work is valuable because it enables me to be the best I can be and the best I am meant to be. It builds the foundation of experience and learning for my future. *"With God all things are possible" Matthew 19:26*