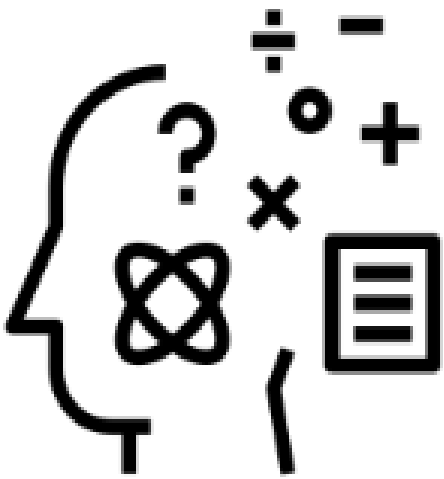
St Anne's
Church of England Academy

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

Year 11 Knowledge Organisers
Term 1



Name:……..

Form:……..

Hard Work Aspiration Integrity Respect

Cranmer Education Trust

Contents Page

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

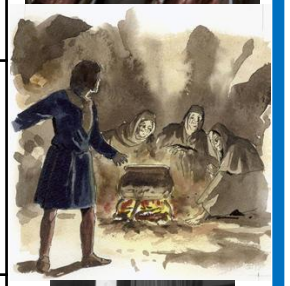
Language for Learning:
Ambition
Loyalty
Fate
Supernatural
Masculinity
Femininity
Tragedy
Stage directions
Soliloquy
Hamartia
Hubris
Prophecy
Paradox
Tragic hero

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 10 Maths Foundation – Perimeter , Area and Volume

Language for Learning

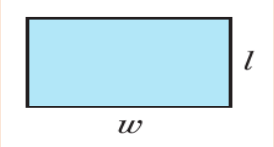
Area
Perimeter
Volume
Surface Area
Rectangle
Triangle
Parallelogram
Trapezium
Diameter
Centre
Radius
Prism
Sector
Circumference

Area and Perimeter

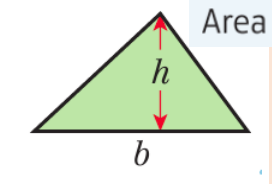
The **perimeter** is the total distance around the outside of a 2D shape

The **Area** of a **2D Shape** is the amount of space inside it

Area is measured in squared units Millimetres squared(mm^2),centimetres squared(cm^2), metres squared (m^2)

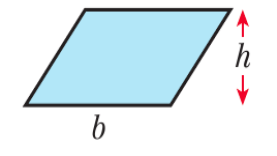


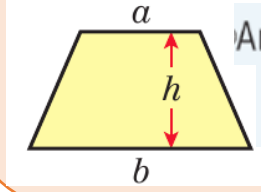
Area of a rectangle = **l**ength x **w**idth



Area of a triangle = $\frac{1}{2}bh$

Area of a Parallelogram = bh

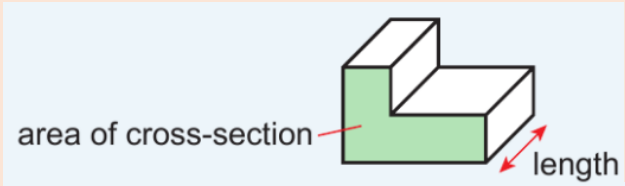




Area of a trapezium $= \frac{1}{2}(a+b)h$

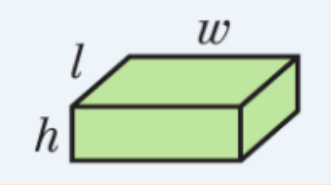
Volume and Surface Area

The volume of a 3D solid is the amount of space inside it.

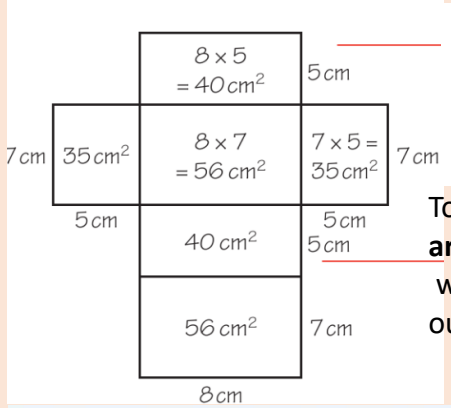


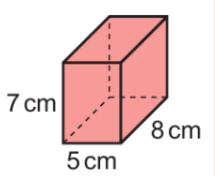
Volume of a prism = area of cross-section × length

Volume is measured in cubic units:
millimetre cubed (mm^3), centimetre cubed (cm^3), metre cubed (m^3).



Volume of a cuboid
=Length x width x height
=**lwh**





To find **the surface area** of this cuboid, we can sketch out its net as shown

The **surface area** of a 3D solid is the total area of all its faces.
To find the surface area of a 3D solid, sketch the net and work out the areas of the faces.

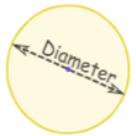
Circles

Circumference

The distance around a circle (perimeter).

Circumference = π × Diameter

$C = \pi d.$



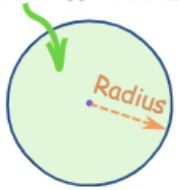
The diameter is twice the length of the radius so

You can also use the formula $C = 2\pi r$

Area

The space inside a circle.

Area = π × radius²



$A = \pi r^2$

Circumference is measured in **cm or m**

Area is measured in **cm² or m²**

Pi (pronounced like "pie") is often written using this Greek Symbol π

It is approximately **3.14159265**.... and can be found on a calculator.

Year 10 Maths Higher - Advanced Trigonometry

Note: Higher students should also visit **Foundation – Angles and Triangles** for this unit

Language for Learning

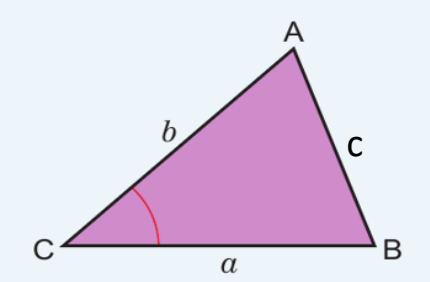
Right-Angled Triangle
Hypotenuse
Opposite
Adjacent
Pythagoras' Theorem
Sine
Cosine
Tangent
Sine Rule
Cosine Rule
Sine Wave
Cosine Wave
Asymptote

Introduction

Pythagoras' Theorem and SOHCAHTOA allow us to work with **ONLY** Right-Angled Triangles.

Advanced Trigonometry allows us to work with **ALL** triangles.

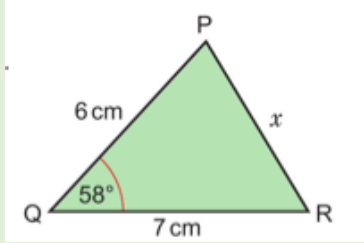
We label the triangle as such



Formulae

The **cosine rule** can be used in any triangle.

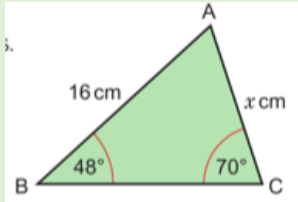
- $a^2 = b^2 + c^2 - 2bc\cos A$ Use this to calculate an unknown *side*.
- $\cos A = \dfrac{b^2 + c^2 - a^2}{2bc}$ Use this to calculate an unknown *angle*.

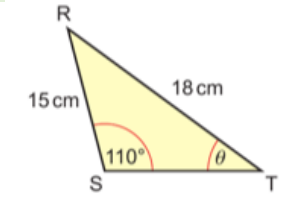


In this problem we are presented with information on **2 side lengths** and an **included angle**. We would use **Cosine Rule to** find the 3rd length.

The **sine rule** can be used in any triangle.

- $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$ Use this to calculate an unknown *side*.
- $\dfrac{\sin A}{a} = \dfrac{\sin B}{b} = \dfrac{\sin C}{c}$ Use this to calculate an unknown *angle*.





In the two problems above we are presented with information on two angles and their two opposite side lengths. Therefore, we would use the **Sine Rule.**

This is useful when we don't know the perpendicular height of the triangle.

Exact "Trig" Values

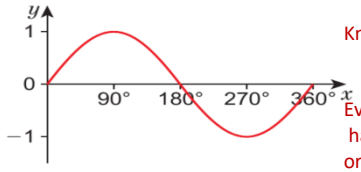
The Sine, Cosine and Tangent of some angles may be written exactly.

	30°	45°	60°	0	90°
sin	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	0	1
cos	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	1	0
tan	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	0	

Trigonometric Graphs

The Sine, Cosine and Tangent functions can be plotted as graphs with angles on the horizontal axis and their Sin/Cos/Tan values on the vertical axis.

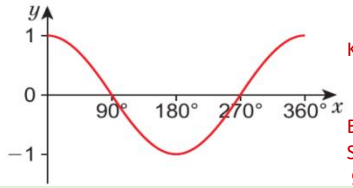
The **sine** graph repeats every 360° in both directions.



Known as the Sine Wave

Ever noticed that no angle has a Sine value above 1 or below -1 ?

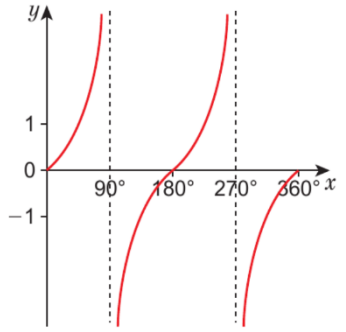
The **cosine** graph repeats every 360° in both directions.



Known as the Cosine Wave

Exactly the same as the Sine Wave except it begins 90 degrees earlier

The **tangent** graph repeats every 180° in both directions.



Notice there is no value for Tan90 in the Values table.

The dotted line is an **asymptote.** The Graph of Tan approaches it but never reaches it

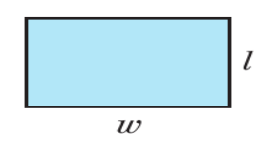
Year 10 Maths Foundation – Perimeter and Area

Language for Learning

Rectangle
Triangle
Parallelogram
Trapezium
Diameter
Centre
Radius
Sector
Segment
Tangent
Chord
Arc
Circumference

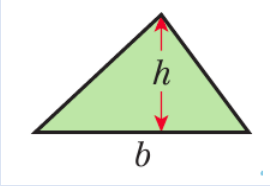
Area

Rectangle



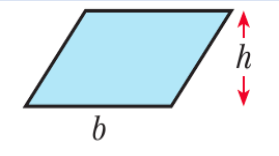
length x **w**idth

Triangle



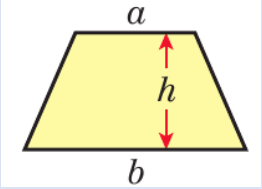
$$\frac{\text{base x height}}{2}$$

Parallelogram



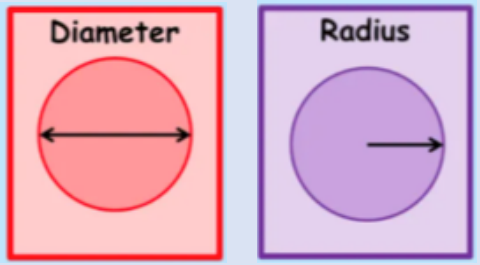
base x **h**eight

Trapezium

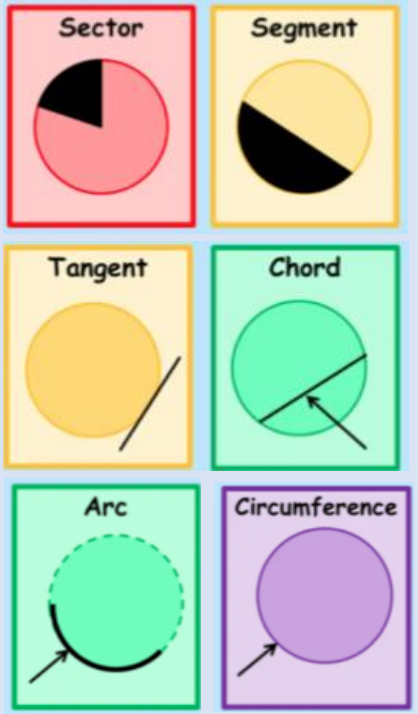


$$\frac{(a + b)}{2} \times h$$

Parts of a circle



Important fact: the **diameter** must pass through the centre of the circle



Circumference

The distance around a circle (perimeter).

Circumference = π × Diameter

$C = \pi d.$

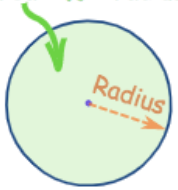
The diameter is twice the length of the radius so

You can also use the formula $C = 2\pi r$

Area

The space inside a circle.

Area = π × radius^2



$A = \pi r^2$

Circumference is measured in **cm or m**

Area is measured in **cm² or m²**

Pi (pronounced like "pie") is often written using the Greek Symbol π

It is approximately 3.14159265…. and can be found on a calculator.

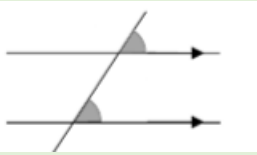
Year 10 Maths Foundation – Angles and Triangles

Language for Learning

Parallel
Corresponding
Alternate
Co-interior
Vertically Opposite
Pythagoras
Trigonometry
Sine (Sin)
Cosine (Cos)
Tangent (Tan)
Hypotenuse
Adjacent
Opposite

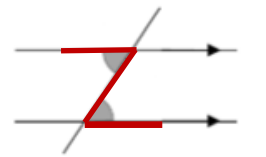
Angle Facts

Parallel lines give rise to these angle facts



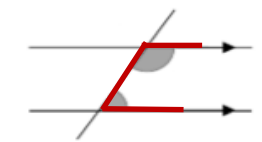
Corresponding Angles are equal

Looks like an F or and upside down F



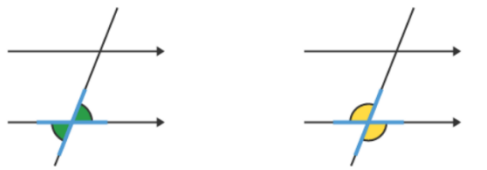
Alternate Angles are equal

Looks like a Z or a back to front Z



Co-Interior Angles sum to **180** degrees

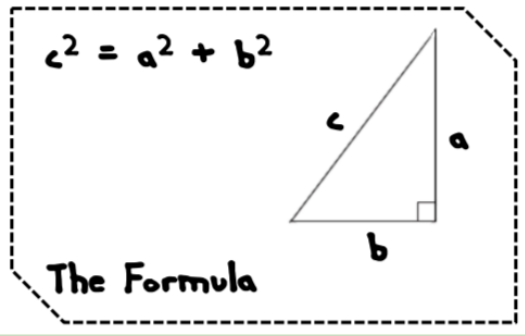
Looks like an C or a back to front C

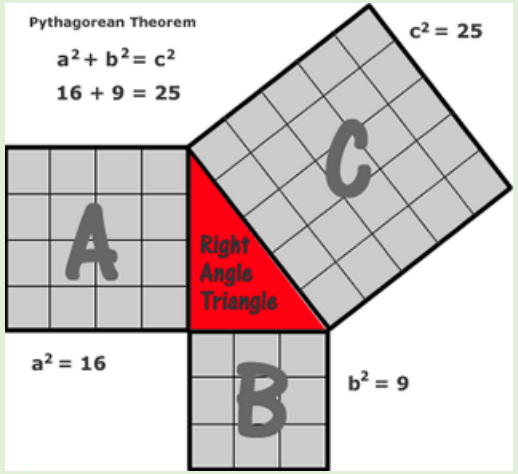


Vertically Opposite angles are equal

Pythagoras' Theorem

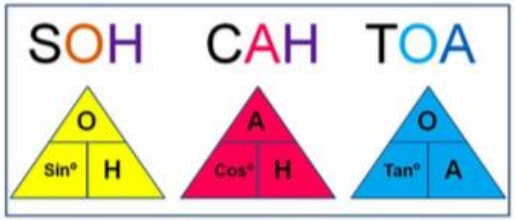
Lets you find the length of any side of a **right-angled triangle**, as long as you have the other two sides.





Trigonometry

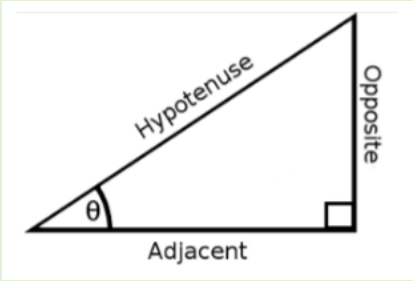
Lets you find either another length or an angle in a **right-angled triangle.**



Hypotenuse: Longest side—opposite the right angle.

Opposite: Opposite the angle given or that you are wanting to find.

Adjacent: Next to the angle given or that you are wanting to find.



In trigonometry there will always be an angle – it is either given to you or you are trying to find it.

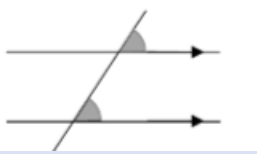
Year 10 Maths Higher - Similarity and Congruence

Language for Learning

Parallel
Corresponding
Alternate
Co-Interior
Vertically Opposite
Congruent
Conditions of congruence
Similar
Enlargement
Scale Factor
Linear Scale factor
Area Scale Factor
Volume Scale Factor
Reciprocal

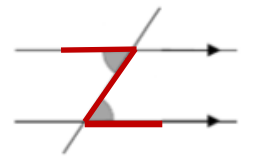
Angle Facts

Parallel lines give rise to these angle facts



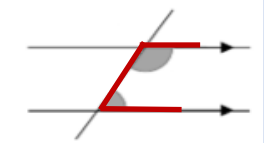
Corresponding Angles are equal

Looks like an F or and upside down F



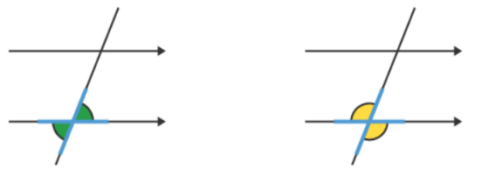
Alternate Angles are equal

Looks like a Z or a back to front Z



Co-Interior Angles sum to **180** degrees

Looks like an C or a back to front C

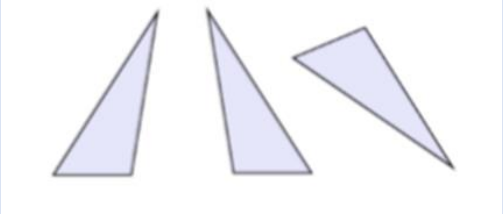


Vertically Opposite angles are equal

Congruence

Congruent triangles have exactly the same shape and size.

Their angles are the same and corresponding side lengths are the same.



Two triangles are congruent when one of the **conditions of congruence** is true

SSS (all three sides are equal)

SAS (two sides and an included angle are equal)

AAS (two angles and a corresponding side are equal

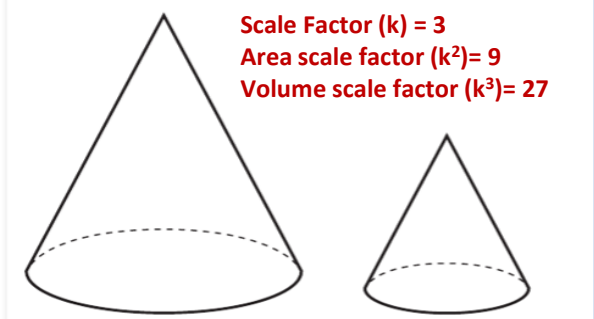
RHS (right-angle, hypotenuse and one other side are equal)

Similarity

Shapes are similar when one is an enlargement of the other.

Similar shapes have **Scale Factors (k)**
If k=2 the shapes sides are twice as long
If k= ½ the shapes sides are half the size.
The scale factor A to B is the **reciprocal** of the scale factor B to A

Similarity in 3D Shapes
When the linear scale factor is **k**
Lengths have a scale factor of **k**
Areas and surface areas have a scale factor of $\mathbf{k^2}$
Volumes and capacities have a scale factor of $\mathbf{k^3}$



KS4 Chemistry, Paper 3, Topic 3 part 2/ Topic 4 Extracting Metals Knowledge Organiser

Language for Learning:

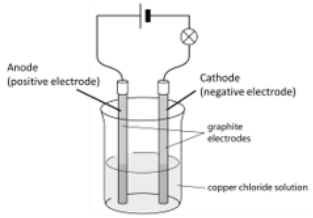
Anode
Bioleaching: Using bacteria to extract metals from their ores.
Cathode
Displacement reaction
Discharged: An ion is discharged when it gains or loses electrons to form a neutral atom or molecule
Dynamic equilibrium
Electrode: A rod made of a metal or graphite that carries the current into or out of the electrolyte.
Electrolysis
Electrolyte: An ionic compound that is molten or dissolved in water.
Half equation
Life cycle assessment
Native state
Ore
Oxidation
Phytoextraction: Using plants to extract metals from their ores.
Redox reaction
Reduction
Reversible reaction

Bold text = higher content

Electrolysis

Electrolysis is the process of passing electricity through an electrolyte. This is usually used to split the electrolyte up into the elements it is made from.
During electrolysis the positive ions travel to the negative electrode and the negative ions travel to the positive electrode. At the electrodes chemical reactions happen which turn the ions back into atoms

Positive
Anode
Negative
Is
Cathode



Products of electrolysis

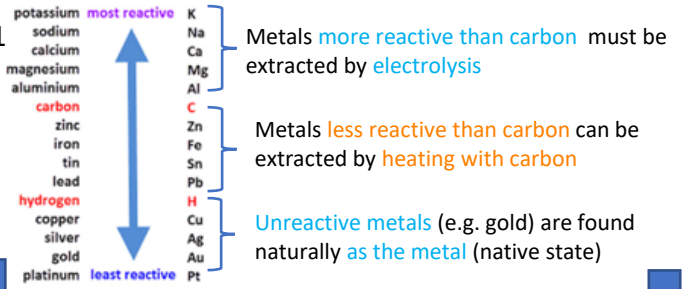
For molten electrolytes the electrolyte is turned back into the elements it is made from.

Electrolyte	Product at cathode	Product at anode
Copper chloride	Copper	Chlorine
Lead bromide	Lead	Bromine

For electrolytes in solution there are 4 ions present (two from the ionic compound, H+ and OH-). Both negative ions are attracted to the anode and both positive ions are attracted to the cathode, but only 1 can discharge.
At the cathode – the hydrogen will form or a metal less reactive than hydrogen.
At the anode – if a halide ion is present the halogen will form, if not oxygen gas will form.

Reactivity Series

Metals react by losing electrons to form positive ions. The metals which lose electrons most easily are the most reactive.
In a displacement reaction a more reactive metal steals the non-metal from a less reactive metal compound.
Most metals are reactive and are not found naturally as metals, but as metal compounds (usually metal oxides) in metal ores. The method used to extract the metal from its ore depends on the reactivity of the metal.



Dynamic Equilibrium

If a reversible reaction takes place in a closed system a dynamic equilibrium is established. Rate of forward reaction = Rate of reverse reaction
If the temperature, pressure or concentration is changed the equilibrium position will shift to try to minimise the change.
If the concentration of reactant is increased more products are made to use them up and vice versa.
Increase in pressure shifts equilibrium to the side with less moles of gas.
A temperature decrease shifts the equilibrium in the exothermic direction.

Redox Reactions

Reduction and oxidation reactions happen together and are given the term Redox.
Redox can be thought of in terms of oxygen
Reduction is losing oxygen
Oxidation is gaining oxygen
Redox and electrons
Oxidation is loss of electrons
Reduction is gain of electrons
Half equations can be used to show the transfer of electrons in redox reactions. They can be used to show Redox in displacement reactions, during heating with carbon and for the reactions occurring at the electrodes during electrolysis

Recycling

Metals should be recycled at the end of their use. This uses less metal ores which can be in short supply and can require a lot of energy and cause environmental problems to extract.
Life Cycle Assessment Stages involved:

- Obtaining raw materials
- Manufacture
- Use
- Disposal

Each of these stages should be evaluated in terms of the materials used, the energy used, the waste produced etc.

KS4 Chemistry, Paper 3, Topic 3 part 2/ Topic 4 Extracting Metals

4.1	Deduce the relative reactivity of some metals, by their reactions with water, acids and salt solutions			
4.2	Explain displacement reactions as redox reactions, in terms of gain or loss of electrons			
4.3	Explain the reactivity series of metals (potassium, sodium, calcium, magnesium, aluminium, (carbon), zinc, iron, (hydrogen), copper, silver, gold) in terms of the reactivity of the metals with water and dilute acids and that these reactions show the relative tendency of metal atoms to form cations			
4.4	Recall that: a most metals are extracted from ores found in the Earth's crust b unreactive metals are found in the Earth's crust as the uncombined elements			
4.5	Explain oxidation as the gain of oxygen and reduction as the loss of oxygen			
4.6	Recall that the extraction of metals involves reduction of ores			
4.7	Explain why the method used to extract a metal from its ore is related to its position in the reactivity series and the cost of the extraction process, illustrated by a heating with carbon (including iron) b electrolysis (including aluminium) (knowledge of the blast furnace is not required)			
4.8	Evaluate alternative biological methods of metal extraction (bacterial and phytoextraction)			
4.9	Explain how a metal's relative resistance to oxidation is related to its position in the reactivity series			
4.10	Evaluate the advantages of recycling metals, including economic implications and how recycling can preserve both the environment and the supply of valuable raw materials			
4.11	Describe that a life-cycle assessment for a product involves consideration of the effect on the environment of obtaining the raw materials, manufacturing the product, using the product and disposing of the product when it is no longer useful			
4.12	Evaluate data from a life cycle assessment of a product			

Objectives		R	A	G
3.22	Recall that electrolytes are ionic compounds in the molten state or dissolved in water			
3.23	Describe electrolysis as a process in which electrical energy, from a direct current supply, decomposes electrolytes			
3.24	Explain the movement of ions during electrolysis, in which: a positively charged cations migrate to the negatively charged cathode b negatively charged anions migrate to the positively charged anode			
3.25	Explain the formation of the products in the electrolysis, using inert electrodes, of some electrolytes, including: a copper chloride solution b sodium chloride solution c sodium sulfate solution d water acidified with sulfuric acid e molten lead bromide (demonstration)			
3.26	Predict the products of electrolysis of other binary, ionic compounds in the molten state			
3.27	Write half equations for reactions occurring at the anode and cathode in electrolysis			
3.28	Explain oxidation and reduction in terms of loss or gain of electrons			
3.29	Recall that reduction occurs at the cathode and that oxidation occurs at the anode in electrolysis reactions			
3.30	Explain the formation of the products in the electrolysis of copper sulfate solution, using copper electrodes, and how this electrolysis can be used to purify copper			
3.31	Core Practical: Investigate the electrolysis of copper sulfate solution with inert electrodes and copper electrodes			

4.13	Recall that chemical reactions are reversible, the use of the symbol ⇌ in equations and that the direction of some reversible reactions can be altered by changing the reaction conditions			
4.14	Explain what is meant by dynamic equilibrium			
4.15	Describe the formation of ammonia as a reversible reaction between nitrogen (extracted from the air) and hydrogen (obtained from natural gas) and that it can reach a dynamic equilibrium			
4.16	Recall the conditions for the Haber process as: a temperature 450 °C b pressure 200 atmospheres c iron catalyst			
4.17	Predict how the position of a dynamic equilibrium is affected by changes in: a temperature b pressure c concentration			

<u>Haber Process</u>

The Haber process is the industrial process used to make ammonia (NH_3)

N_2 (g) + $3H_2$ (g) ⇌ $2NH_3$ (g) + Heat

Nitrogen gas comes from the fractional distillation of air. Hydrogen gas comes from methane.

Temperature = 450 °C (low) Pressure = 200 atmospheres (high) Catalyst = Iron catalyst

Choosing conditions to maximise the yield of ammonia

Conditions are chosen to 'shift' the position of the equilibrium to the RHS to increase the amount of ammonia formed

- **Use high concentration of Nitrogen and Hydrogen and drain the ammonia off as it forms**
- **The reaction has more gas molecules on the LHS so more ammonia is formed at high pressure**
- **The forward reaction is exothermic so more ammonia is formed at low temperature**
- **Catalyst – does not effect equilibrium, but speeds up rate of the reaction.**

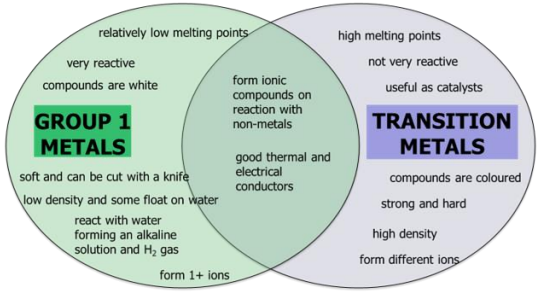
KS4 Chemistry, Paper 3, Topic 5 Separate Chemistry 1 Knowledge Organiser

Language for Learning:
Alloy
Atom Economy
Avogadro's Law
By-product: Any product formed in a reaction in addition to the required product.
Calibrated: Marked with a scale for accurate readings.
Catalyst: A substance that speeds up a process, without itself being used up.
Dessicant: A substance that absorbs water or water vapour.
Electroplating
Galvanising: Coating iron or steel with a thin layer of zinc to improve its resistance to rusting.
Molar gas volume: The volume occupied by one mole of molecules of any gas. It is 24 dm^3, or 24 000 cm^3, at room temperature and pressure.
Sacrificial Protection
Side reactions: A reaction which takes place at the same time as another main reaction.
Transition metal
Yield

Triple Science Only

Transition Metals

The transition metals found between group 2 and 3 in the periodic table.



Corrosion

The reaction of metals with oxygen :

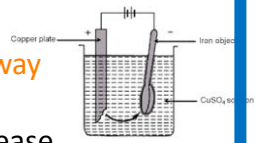
metal + oxygen --> metal oxide

Some metals (e.g. aluminium) tarnish. The metal forms a protective layer of metal oxide which stops the metal corroding further.
Corrosion of iron is called rusting. Rusting requires oxygen and water to form rust (hydrated iron oxide).

iron + oxygen + water ⟶ hydrated iron oxide

This is an oxidation reaction. More reactive metals lose electrons more easily and corrode more easily.

Methods to prevent rusting



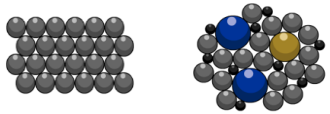
All methods keep oxygen or water or both away from the metal

- Paint, coat with plastic, coat with oil or grease
- Sacrificial protection : Include a more reactive metal which will corrode in preference.
- Electroplating is used to coat a thin layer of one metal on top of another metal, I.e. galvanising or gold plating

The method used for electroplating is the same as for electrolysis where the cathode is the metal object which is being coated and the anode is the coating.

Alloys

An alloy is a mixture of metals or a mixture of metal and carbon. Alloys are used because they have improved properties over pure metals.
Alloys have metal atoms of different sizes. This disturbs the regular structure and means the layers can't slide over each other making them much harder and stronger



Steel - an alloy of iron and carbon. Mild steel contains only a small % of carbon and is soft. Higher % carbon steel is much stronger and harder. Stainless steel contains chromium which forms a protective layer and so it does not corrode.
Magnalium – an alloy with 95% aluminium and 5% magnesium. It is used for aircraft parts and is less dense and 4x stronger than aluminium alone
Brass - an alloy of copper and zinc. Copper is a better conductor of electricity, but brass is much stronger and is used for making the pins on plugs.

Quantitative analysis

The yield of a reaction is how much product you make.
% Yield = actual yield/expected yield x 100
The actual yield is always less than the expected yield
The % atom economy is a measure of how efficient or sustainable a chemical reaction is. % Atom economy = M_r of useful product/total M_r of products x 100
The preferred units for concentration are mol/dm3. This is 1 mol/dm3 = 1 Molar solution = 1M. Moles = concentration (mol / dm3) x volume (dm3)
OR concentration in mol/dm3 = concentration in g/dm3 / M_r
Avogadro's law states that at constant temperature and pressure 1 mole of any gas will occupy the same volume, regardless of which gas it is. At room temperature and pressure (RTP) 1 mole of any gas occupies 24 dm^3
Moles = Volume (dm^3)/24 = Volume (cm^3)/24,000
Titration calculations
A titration calculation is used to find the unknown concentration of a solution. Write a balanced equation for the reaction, calculate the moles of acid using moles = concentration x volume (dm^3). Use the balanced equation to find the moles of alkali, find the concentration alkali using concentration = moles/volume (dm^3)

KS4 Chemistry, Paper 3, Topic 5 Separate Chemistry 1

Objectives		R	A	G
C1.1	Recall that most metals are transition metals and that their typical properties include: a high melting point b high density c the formation of coloured compounds d catalytic activity of the metals and their compounds as exemplified by iron			
C1.2	Recall that the oxidation of metals results in corrosion			
C1.3	Explain how rusting of iron can be prevented by: a exclusion of oxygen b exclusion of water c sacrificial protection			
C1.4	Explain how electroplating can be used to improve the appearance and/or the resistance to corrosion of metal objects			
C1.5	Explain, using models, why converting pure metals into alloys often increases the strength of the product			
C1.6	Explain why iron is alloyed with other metals to produce alloy steels			
C1.7	Explain how the uses of metals are related to their properties (and vice versa), including aluminium, copper and gold and their alloys including magnalium and brass			
C1.8	Calculate the concentration of solutions in mol dm–3 and convert concentration in g dm–3 into mol dm–3 and vice versa			
C1.9	Core Practical: Carry out an accurate acid-alkali titration, using burette, pipette and a suitable indicator			
C1.10	Carry out simple calculations using the results of titrations to calculate an unknown concentration of a solution or an unknown volume of solution required			
C1.11	Calculate the percentage yield of a reaction from the actual yield and the theoretical yield			
C1.12	Describe that the actual yield of a reaction is usually less than the theoretical yield and that the causes of this include: a incomplete reactions b practical losses during the experiment c competing, unwanted reactions (side reactions)			
C1.13	Recall the atom economy of a reaction forming a desired product			
C1.14	Calculate the atom economy of a reaction forming a desired product			
C1.15	Explain why a particular reaction pathway is chosen to produce a specified product, given appropriate data such as atom economy, yield, rate, equilibrium position and usefulness of by-products			
C1.16	Describe the molar volume, of any gas at room temperature and pressure, as the volume occupied by one mole of molecules of any gas at room temperature and pressure (The molar volume will be provided as 24 dm3 or 24000 cm3 in calculations where it is required)			
C1.17	Use the molar volume and balanced equations in calculations involving the masses of solids and volumes of gases			
C1.18	Use Avogadro's law to calculate volumes of gases involved in a gaseous reaction, given the relevant equation			
C1.19	Describe the Haber process as a reversible reaction between nitrogen and hydrogen to form ammonia			
C1.20	Predict how the rate of attainment of equilibrium is affected by: a changes in temperature b changes in pressure c changes in concentration d use of a catalyst			
C1.21	Explain how, in industrial reactions, including the Haber process, conditions used are related to: a the availability and cost of raw materials and energy supplies b the control of temperature, pressure and catalyst used produce an acceptable yield in an acceptable time			
C1.22	Recall that fertilisers may contain nitrogen, phosphorus and potassium compounds to promote plant growth			
C1.23	Describe how ammonia reacts with nitric acid to produce a salt that is used as a fertiliser			
C1.24	Describe and compare: a the laboratory preparation of ammonium sulfate from ammonia solution and dilute sulfuric acid on a small scale b the industrial production of ammonium sulfate, used as a fertiliser, in which several stages are required to produce ammonia and sulfuric acid from their raw materials and the production is carried out on a much larger scale (details of the industrial production of sulfuric acid are not required)			
C1.25	Recall that a chemical cell produces a voltage until one of the reactants is used up			
C1.26	Recall that in a hydrogen–oxygen fuel cell hydrogen and oxygen are used to produce a voltage and water is the only product			
C1.27	Evaluate the strengths and weaknesses of fuel cells for given uses			

Fertilisers

Plants need a supply of mineral ions in particular Nitrogen, Phosphorus and Potassium (NPK). These ions are supplied in soluble compounds particularly Ammonium Sulphate ($(NH_4)_2SO_4$) and Ammonium Nitrate (NH_4NO_3)

These compounds can be prepared by neutralisation reactions of ammonia (NH_3) prepared from the Haber Process) with sulphuric and nitric acids.

Ammonia solution + sulphuric acid --> ammonium sulphate

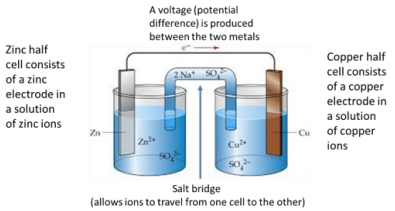
$2NH_3$ (aq) + H_2SO_4 (aq) --> $(NH_4)_2SO_4$ (aq)

Ammonia solution + nitric acid --> ammonium nitrate

NH_3 (aq) + HNO_3 (aq) --> NH_4NO_3 (aq)

Chemical cells and Fuel cells

A battery (disposable or rechargeable) is a chemical cell which consists of 2 metals in solutions of their metal ions and a salt bridge to allow ions to flow from one solution to the other.



The overall equation for the reaction

$$CuSO_4 (aq) + Zn (s) \rightarrow ZnSO_4 (aq) + Cu (s)$$

Batteries go flat because one of the reactants is used up and a voltage is no longer produced.

A fuel cell is an electrochemical cell. Fuel is supplied to one electrode and oxygen is supplied to the other. The fuel is oxidised electrochemically (not burnt) and as long as fuel and oxygen are supplied electricity is made. In a hydrogen fuel cell the fuel is hydrogen and the only products are water and electricity, so no carbon dioxide is made.

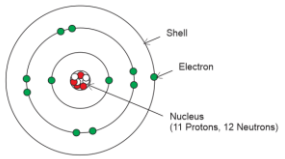
KS4 Physics, Paper 5, Topic 9 Electricity Knowledge Organiser

Bold text = higher content
Highlighted text = Triple Physics content

Language for Learning:

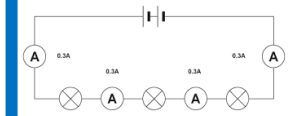
Alternating current (a.c.) – Current whose direction changes many times each second.
Ammeter – A meter used to measure current.
Ampere – The unit for current. Can be shortened to amp.
Battery – More than one cell joined together.
Cell – A chemical store of energy that can be transferred by electricity.
Circuit breaker – An electrical component that switches off the current in a circuit if there is a fault and the current rises to dangerous levels. It can be switched back on when the fault is fixed.
Component – A part of something, e.g. a lamp might be a component of an electrical circuit.
Coulomb – The unit for measuring charge.
Diode – A component that lets electric current flow through it in one direction only.
Direct current (d.c.) – A current that flows in one direction only, such as the current produced by a battery.
Fuse – A safety device containing a length of wire that is designed to melt if the current in a circuit is too high.
Light dependent resistor (LDR) – A resistor whose resistance gets lower when light shines on it.
National Grid – The system of wires and transformers that distributes electricity around the country.
Ohm – The unit for measuring electrical resistance.
Parallel circuit – A circuit in which there is more than one path for the current to follow.
Potential difference – The energy transferred to or from a coulomb of electric charge when it flows between two points. Sometimes called voltage.
Resistance – A measurement of how difficult it is for electricity to flow through something.
Series circuit – A type of circuit with only one loop of wire.
Thermistor – A component whose resistance changes as its temperature changes. The thermistors you will meet increase in resistance as the temperature increases.
Voltage – Meter used to measure potential difference (or voltage).

Model of the atom



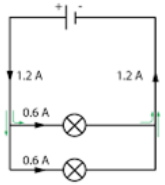
Current (rate of flow of electrons)

Coulombs, C → Q = I x t ← Amps, A; Seconds, s

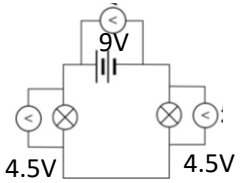


Current is the same at all points in a series circuit.

Current is shared between branches in a parallel circuit.

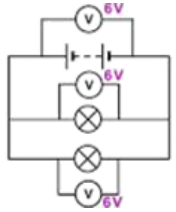


Potential Difference

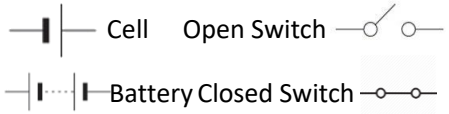


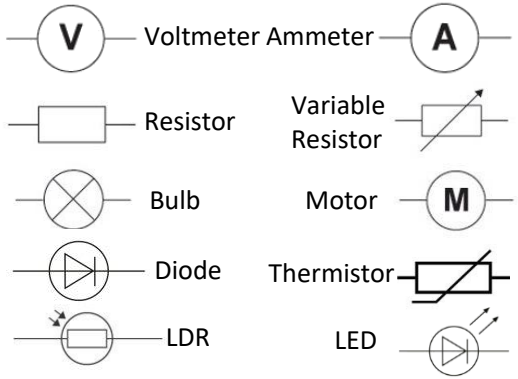
Potential difference is shared between components in a series circuit.

Potential difference is the same across branches of a parallel circuit.



Circuit Symbols





Q:Why are circuit symbols helpful?

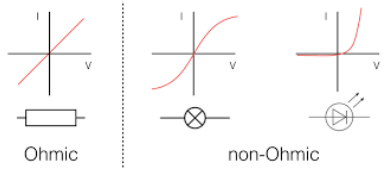
Resistance

More resistance = higher temperature

Volts, V → V = I x R ← Amps, A; Ohms, Ω

In a series circuit, the total resistance is the sum of the individual resistances.
In a parallel circuit, the total resistance is less than the smallest resistor value.

IV Graphs



Q:Describe each of the graphs above.

Energy transfer

E.g. a kettle transfers energy electrically from the mains a.c. supply to the thermal energy store of the heating element in the kettle.

E = I x t x V

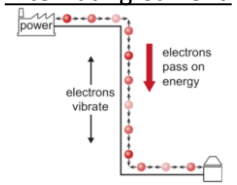
Joules, J ← E; Amps, A ← I; Seconds, s ← t; Volts, V ← V

Q:Describe energy transfers in a battery fan?

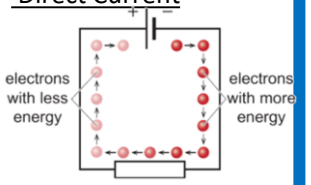
Power (rate of energy transfer)

Watts, W → P = E / t; P = I x V; P = I^2 x R

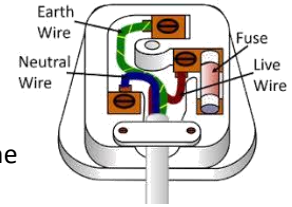
Alternating Current



Direct Current



Three Core Cables



Earth connects the metal parts of the cable to the ground. Used for safety as the charge will take this path, set at 0V.
Neutral wire is the return path to the power station. It has a voltage of 0V.
Live wire connects the appliance to the generators at the power station. The voltage is 230 V and frequency 50 Hz.

Fuses

- For safety
- Melt if too much current flows
- A fuse slightly higher than the current of the appliance should be chosen

Q:What would happen if the fuse chosen was a lot higher or lower than the appliance current rating?

Circuit Breakers

- 'Trip' if there is too much current flow
- Do not need to be replaced if tripped
- Work faster than a fuse

KS4 Physics, Paper 5, Topic 9 Electricity

Objectives		R	A	G
10.1	Describe the structure of the atom, limited to the position, mass and charge of protons, neutrons and electrons			
10.2	Draw and use electric circuit diagrams representing them with the conventions of positive and negative terminals, and the symbols that represent cells, including batteries, switches, voltmeters, ammeters, resistors, variable resistors, lamps, motors, diodes, thermistors, LDRs and LEDs			
10.3	Describe the differences between series and parallel circuits			
10.4	Recall that a voltmeter is connected in parallel with a component to measure the potential difference (voltage), in volt, across it			
10.5	Explain that potential difference (voltage) is the energy transferred per unit charge passed and hence that the volt is a joule per coulomb			
10.6	Recall and use the equation: E = Q x V			
10.7	Recall that an ammeter is connected in series with a component to measure the current, in amp, in the component			
10.8	Explain that an electric current as the rate of flow of charge and the current in metals is a flow of electrons			
10.9	Recall and use the equation: Q = I x t			
10.10	Recall that current is conserved at a junction in a circuit			
10.11	Recall that current is conserved at a junction in a circuit			
10.12	Explain how changing the resistance in a circuit changes the current and how this can be achieved using a variable resistor			
10.13	Recall and use the equation: V = I x R			
10.14	Explain why, if two resistors are in series, the net resistance is increased, whereas with two in parallel the net resistance is decreased			
10.15	Calculate the currents, potential differences and resistances in series circuits			
10.16	Explain the design and construction of series circuits for testing and measuring			
10.17	Core Practical: Construct electrical circuits to: investigate the relationship between potential difference, current and resistance for a resistor and a filament lamp, and test series and parallel circuits using resistors and filament lamps			
10.18	Explain how current varies with potential difference for the following devices and how this relates to resistance; filament lamps, diodes and fixed resistors.			
10.19	Describe how the resistance of a light-dependent resistor (LDR) varies with light intensity			
10.20	Describe how the resistance of a thermistor varies with change of temperature (negative temperature coefficient thermistors only)			
10.21	Explain how the design and use of circuits can be used to explore the variation of resistance in the following devices; filament lamps, diodes, thermistors and LDRs.			
10.22	Recall that, when there is an electric current in a resistor, there is an energy transfer which heats the resistor			
10.23	Explain that electrical energy is dissipated as thermal energy in the surroundings when an electrical current does work against electrical resistance			
10.24	Explain the energy transfer (in 10.22 above) as the result of collisions between electrons and the ions in the lattice			
10.25	Explain ways of reducing unwanted energy transfer through low resistance wires			
10.26	Describe the advantages and disadvantages of the heating effect of an electric current			
10.27	Use the equation: E = I ×V ×t			
10.28	Describe power as the energy transferred per second and recall that it is measured in watt			
10.29	Recall and use the equation: P = E / t			
10.30	Explain how the power transfer in any circuit device is related to the potential difference across it and the current in it			
10.31	Recall and use the equations: P = I ×V and P = I × R			
10.32	Describe how, in different domestic devices, energy is transferred from batteries and the a.c. mains to the energy of motors and heating devices			
10.33	Explain the difference between direct and alternating voltage			
10.34	Describe direct current (d.c.) as movement of charge in one direction only and recall that cells and batteries supply direct current (d.c.)			
10.35	Describe that in alternating current (a.c.) the movement of charge changes direction			
10.36	Recall that in the UK the domestic supply is a.c., at a frequency of 50 Hz and a voltage of about 230 V			
10.37	Explain the difference in function between the live and the neutral mains input wires			
10.38	Explain the function of an earth wire and of fuses or circuit breakers in ensuring safety			
10.39	Explain why switches and fuses should be connected in the live wire of a domestic circuit			
10.40	Recall the potential differences between the live, neutral and earth mains wires			
10.41	Explain the dangers of providing any connection between the live wire and earth			
10.42	Describe, with examples, the relationship between the power ratings for domestic electrical appliances and the changes in stored energy when they are in use			

Seneca Assignment	Score (%)	10.1.7 Electrical Work & Heating		10.2.4 Parallel Circuits 2	
10.1.1 Current		10.1.8 Circuit Diagrams & Components		**10.2.5 Grade 9 - Circuits**	
10.1.2 Conductors		10.1.9 Diodes, LDRs & Thermistor		10.3.1 Domestic Uses	
10.1.3 Potential Difference		10.2.1 Series Circuit		10.3.2 Domestic Uses 2	
10.1.4 Resistance		10.2.2 Series Circuit 2		10.3.3 Fuses	
10.1.5 Measuring Resistance		10.2.3 Parallel Circuits		10.3.4 Wires	
10.1.6 Variable Resistance				10.3.5 End of Topic Test	

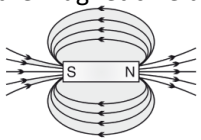
KS4 Physics, Paper 6, Topic 11 Magnetism and Electromagnets Knowledge Organiser

Bold text = higher content
Highlighted text = Triple Physics content

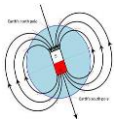
Language for Learning:

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

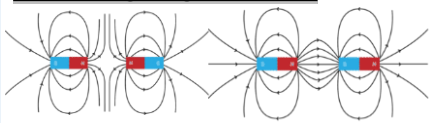
Magnetic field around a bar magnet. The closer the field lines, the stronger the magnetic field.



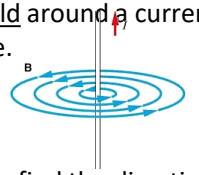
The Earth's Magnetic Field
The Earth's liquid iron core produces a magnetic field. It's south magnetic pole is actually at the Earth's geographical North pole. So the north pole of a compass points North.



Interacting Magnetic fields

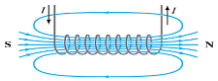


Magnetic field around a current carrying wire.



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

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

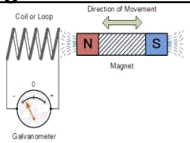
Potential difference in the primary coil, (V) → V_P
Potential difference in the secondary coil, (V) → V_S

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;

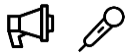
Electromagnetic Induction



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 Triple Biology, Paper 2, Topic 7 Animal Coordination, Control and Homeostasis Knowledge Organiser

H = Triple Higher Content

Language for Learning:

dermis Layer below the epidermis of the skin, which contains temperature receptors, sweat glands and erector muscles.

epidermis Outer layer of skin

erector muscle Muscle in the skin dermis that contracts and raises a body hair.

fever A core body temperature that is too high (above 38 °C).

hypothalamus Part of the brain that monitors and controls body temperature.

hypothermia A core body temperature that is too low (below 36 °C).

negative feedback Where a change in a system causes a response that brings about the opposite change, returning the system to a 'normal' level.

shivering Rapid contraction and relaxation of muscles that causes the body to warm up.

thermoregulation The control of body temperature, especially in core parts of the body (e.g. heart, liver and brain).

vasoconstriction Narrowing of blood vessels, which reduces blood flow.

vasodilation Widening of blood vessels, which increases blood flow.

dialysis Process used to clean the blood of people with kidney failure. It involves the exchange of substances between blood and dialysis fluid across a partially permeable membrane.

kidney The organ that removes urea, excess water and other substances from the blood to form urine.

osmoregulation. The control of the balance of water and mineral ions in the body.

urea A waste product from the breakdown of excess amino acids in the liver.

ADH Antidiuretic hormone. Hormone produced by the pituitary gland that increases the permeability of the collecting duct in a nephron to water.

Bowman's capsule The start of a nephron where filtration occurs.

collecting duct The final part of a nephron.

first convoluted tubule Part of a nephron where selective reabsorption of glucose and some mineral ions takes place.

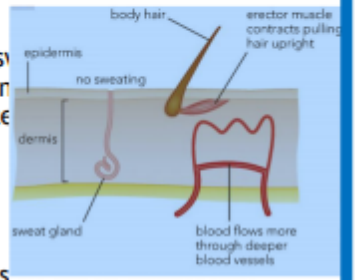
glomerulus A network of blood capillaries associated with the Bowman's capsule of a nephron.

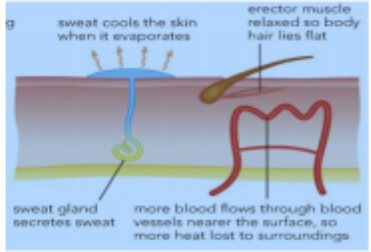
loop of Henle Long loop of a nephron involved in osmoregulation.

nephron Long tubule found in the kidney where filtration of blood occurs, and reabsorption of useful substances, leaving waste and excess substances in urine.

Thermoregulation The Thermoregulatory centre in the hypothalamus of the brain monitors blood temperature using temperature receptors. Temperature receptors in the skin also send impulses along sensory neurones to the thermoregulatory centre.

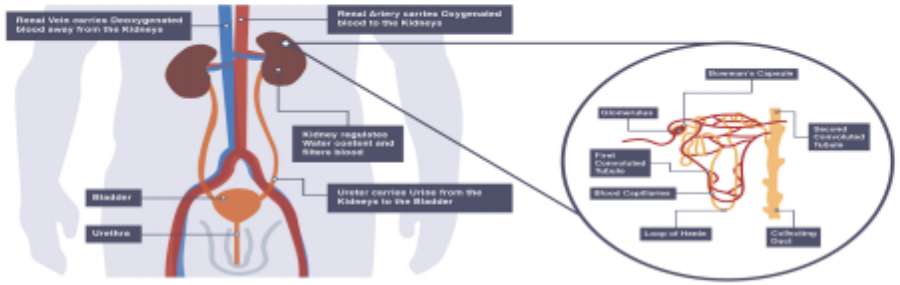
Body temperature too low: 1) Impulses stop being sent along motor neurones to sweat glands, so sw stops 2) Vasoconstriction occurs - blood vessels in the skin constrict so less blood flows near the skin and less heat is transferred to the environment 3) start to shiver by muscles contracting to generate



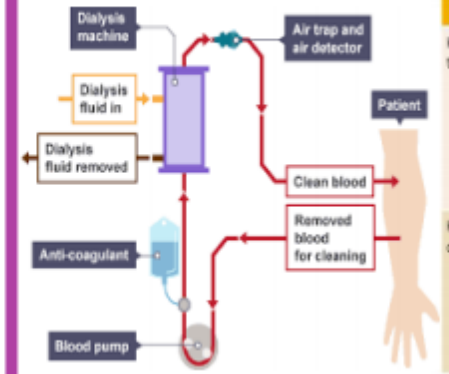


Body temperature too high: 1) Impulses sent along motor neurones sweat glands and sweating starts. Sweat cools the body as it evaporates. 2) Vasodilation occurs - blood vessels in the skin dilate (open up) so more blood flows near the skin's surface and more heat energy is transferred to the environment

Osmoregulation The control of the balance of water and mineral ions in the body.

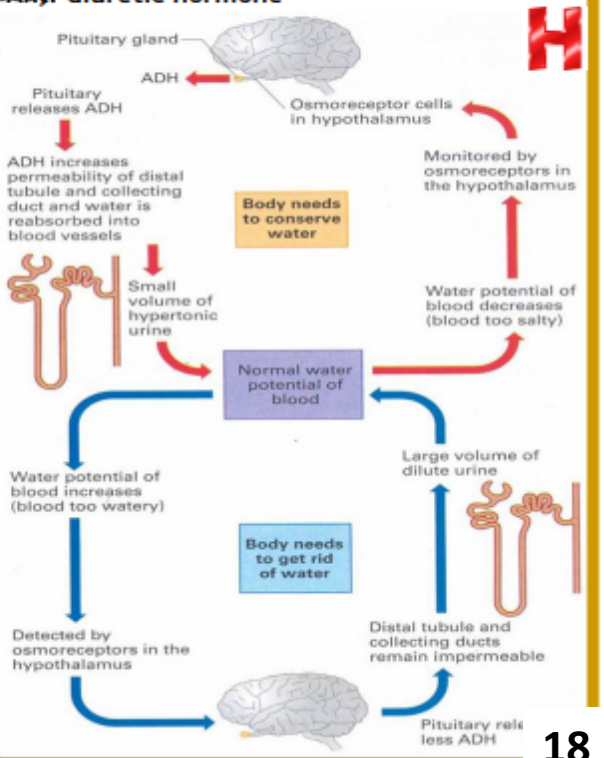


If the kidneys fail there are two options; dialysis or transplant.



	Advantages	Disadvantages
Kidney transplants	Patients can lead a more normal life without having to watch what they eat and drink Cheaper for the NHS overall	Must take immune-suppressant drugs which increase the risk of infection Shortage of organ donors Kidney only lasts 8-9 years on average Any operation carries risks
Kidney dialysis	Available to all kidney patients (no shortage) No need for immune-suppressant drugs	Patient must limit their salt and protein intake between dialysis sessions Expensive for the NHS Regular dialysis sessions – impacts on the patient's lifestyle

Anti-diuretic hormone



KS4 Triple Biology, Paper 2, Topic 7 Animal Coordination, Control and Homeostasis

H = Higher Content

Objectives		R	A	G
7.10B	Explain the importance of homeostasis, including: a thermoregulation – the effect on enzyme activity b osmoregulation – the effect on animal cells			
7.11B	Explain how thermoregulation takes place, with reference to the function of the skin, including: a the role of the dermis b the role of the epidermis c the role of the hypothalamus			
7.12B H	Explain how thermoregulation takes place, with reference to: a shivering **b vasoconstriction** **c vasodilation**			
7.18B	Describe the structure of the urinary system			
7.19B	Explain how the structure of the nephron is related to its function in filtering the blood and forming urine including: a filtration in the glomerulus and Bowman's capsule b selective reabsorption of glucose c reabsorption of water			
7.20B H	**Explain the effect of ADH on the permeability of the collecting duct in regulating the water content of the blood**			
7.21B	Describe the treatments for kidney failure, including kidney dialysis and organ donation			
7.22B	State that urea is produced from the breakdown of excess amino acids in the liver			

Seneca Assignment	Score
7.1.1 Endocrine System	
7.1.2 Thyroxine and adrenaline	
7.1.3 Puberty	
7.1.4 Menstruation	
7.1.5 Contraception	
7.1.6 Contraception 2	
7.1.7 Infertility	
7.1.8 Grade 9 Hormonal	
7.2.1 Homeostasis	
7.2.2 Homeostasis 2	
7.2.3 Blood Glucose	
7.2.4 Diabetes	
7.2.5 End of Topic Test -	
7.2.1 Homeostasis	
7.2.3 Thermoregulation	
7.2.4 Warming Up & Cooling Down	
7.2.5 Blood Glucose	
7.2.6 Diabetes	
7.2.7 Osmotic Balance	
7.2.8 Urea and Urine	
7.2.9 Dialysis	
7.2.10 Transplants	
7.2.11 End of Topic Test - Homeostasis and Hormones	

KS4 Combined Science - Biology, Paper 2, Topic 7 Animal Coordination, Control and Homeostasis Knowledge Organiser

H = Combined Higher Content

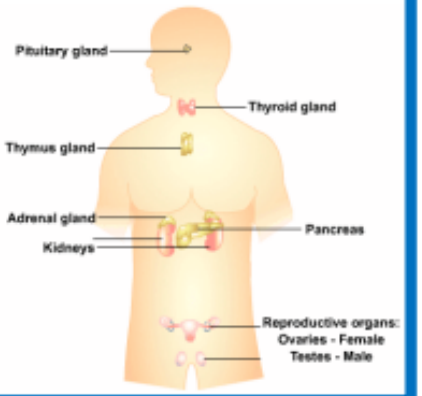
Language for Learning:

homeostasis The maintenance of a constant internal environment.
target organ An organ on which a hormone has an effect.
hormone Chemical messenger that is released into the blood from an endocrine gland and causes target cells to change how they work.
endocrine gland An organ that makes and releases hormones into the blood.
negative feedback A control mechanism in which a change in a condition, such as temperature, causes the opposite change to happen and so brings the condition back to a normal level.
contraception The prevention of pregnancy.
fertilisation Fusing of a male gamete with a female gamete.
menopause When the menstrual cycle stops completely.
menstrual cycle A monthly cycle involving the reproductive organs in women.
menstruation The breakdown and loss of the thickened part of the uterus lining at the start of a woman's menstrual cycle.
ovulation The release of an egg from an ovary.
Assisted Reproductive Technology (ART) Technology that helps to increase the chance of pregnancy, such as the use of hormones to stimulate egg release.
corpus luteum A structure formed from the egg follicle after an egg cell is released from an ovary. It produces progesterone.
egg follicle Cells in the ovary that surround a developing egg. The follicle produce hormones, such as oestrogen.
follicle-stimulating hormone (FSH) A hormone produced by the pituitary gland that causes egg cells to mature in ovaries.
luteinising hormone A hormone produced by the pituitary gland that causes ovulation.
homeostasis Controlling the internal environment of the body at stable levels.
body mass index (BMI) An estimate of the amount of fat in a person's body, using their mass and height, on which judgements of health are made.
waist : hip ratio An estimate of the amount of the fat in the body, calculated by dividing the waist measurement by the hip measurement. It can be used to make judgements about health.
Insulin A hormone produced by the pancreas to lower blood glucose .
Glycogen Made up of many glucose molecules joined together. Stored in the liver.
Glucagon A hormone produced by the pancreas when blood glucose concentration is too low.
Diabetes 1 The pancreas produces little or no insulin. Treated with insulin injections.
Diabetes 2 Patients are resistant to insulin. Treated with a balanced diet and active lifestyle.

H **Adrenaline** Prepares the body for fight or flight
Effects: Heart (beats faster & stronger), liver (releases glucose) blood vessels going to muscles (get wider), blood vessels going to organs (get narrower)

Endocrine System

- Endocrine organs make and release hormones into the blood
- Pituitary = FSH, LH
- Thyroid = thyroxine
- Adrenal = adrenaline
- Pancreas = insulin, glucagon
- Ovaries = oestrogen
- Testes = testosterone



The Menstrual Cycle (FSH and H =))

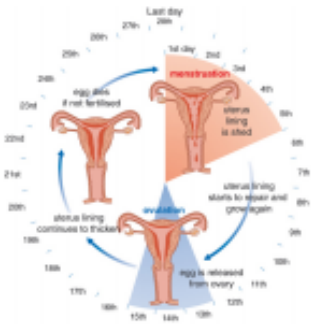
Oestrogen = Causes the release of FSH and the thickening of the uterus lining. High oestrogen levels cause LH release.

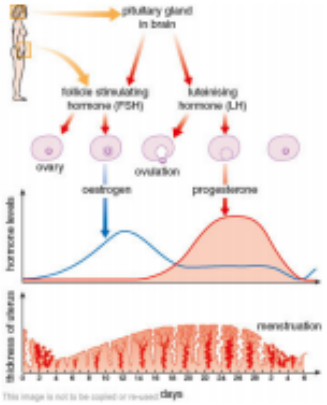
FSH = Causes one follicle to develop and mature the egg cell within it.

LH = Causes ovulation when the egg is released from the follicle.

Corpus Luteum = the follicle becomes a corpus luteum after ovulation, and releases progesterone. It breaks down over two weeks.

Progesterone = Maintains the thickness of the uterus lining, inhibits FSH release. Falling progesterone levels trigger ovulation.





Control of blood glucose

Glucose enters the blood stream

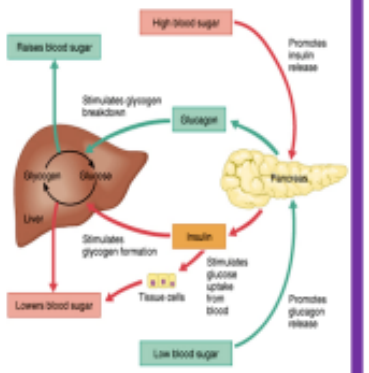
The pancreas releases insulin

Glucose is converted to glycogen and stored in the liver

H Blood glucose levels fall

Pancreas release glucagon

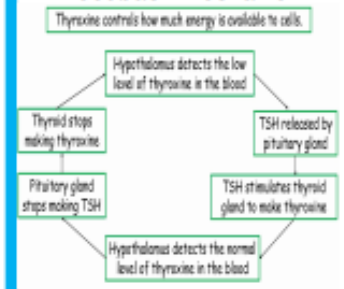
Glycogen is broken down into glucose



There are two types of diabetes - you need to know the differences and how they are treated.

Type 1	Type 2
Pancreas does not make enough insulin = INSULIN DEPENDENT	The body cannot use insulin properly = INSULIN RESISTANT
Usually occurs between the ages of 0-40	Usually occurs in age 40+ or people with a high BMI
Treatment = insulin injections	Treatment = Balanced diet and exercise

H **Thyroxine** controls metabolic rate via a negative feedback mechanism



1) Low levels of thyroxine stimulates production of TRH in hypothalamus
2) This causes the release of TSH from the pituitary gland
3) TSH causes the thyroid to produce thyroxine
4) Normal levels of thyroxine inhibits the release of TRH and the production of TSH

KS4 Combined Science - Biology, Paper 2, Topic 7 Animal Coordination, Control and Homeostasis

Combined Higher Content

Objectives		R	A	G
7.1	Describe where hormones are produced and how they are ransported from endocrine glands to their target organs, including the pituitary gland, thyroid gland, pancreas, adrenal glands, ovaries and testes			
7.2	**Explain that adrenalin is produced by the adrenal glands to prepare the body for fight or flight, including:** **a increased heart rate b increased blood pressure. c increased blood flow to the**			
7.3	**Explain how thyroxine controls metabolic rate as an example of negative feedback, including:** **a low levels of thyroxine stimulates production of TRH in hypothalamus** **b this causes release of TSH from the pituitary gland** **c TSH acts on the thyroid to produce thyroxine** **d when thyroxine levels are normal thyroxine inhibits the release of TRH and the production of TSH**			
7.4	Describe the stages of the menstrual cycle, including the roles of the hormones oestrogen and progesterone, in the control of the menstrual cycle			
7.5	**Explain the interactions of oestrogen, progesterone, FSH and LH in the control of the menstrual cycle, including the repair and maintenance of the uterus wall, ovulation and menstruation**			
7.6	Explain how hormonal contraception influences the menstrual cycle and prevents pregnancy			
7.7	Evaluate hormonal and barrier methods of contraception			
7.8	**Explain the use of hormones in Assisted Reproductive Technology (ART) including IVF and clomifene therapy**			
7.9	Explain the importance of maintaining a constant internal environment in response to internal and external change			
7.13	Explain how the hormone insulin controls blood glucose Concentration			
7.1	**Explain how blood glucose concentration is regulated by Glucagon**			
7.15	Explain the cause of type 1 diabetes and how it is controlled			
7.16	Explain the cause of type 2 diabetes and how it is controlled			
7.17	Evaluate the correlation between body mass and type 2 diabetes including waist:hip calculations and BMI, using the BMI equation: BMI = mass (kg) / (height (m))2			

Seneca Assignment	Score (%)
7.1.1 Endocrine System	
7.1.2 Thyroxine and adrenalir	
7.1.3 Reproductive Hormones	
7.1.4 Reproductive Hormones 2	
7.1.5 Contraception	
7.1.6 Contraception 2	
7.1.7 Infertility	
7.1.8 Grade 9 Hormonal Coordination	
7.2.1 Homeostasis	
7.2.2 Homeostasis 2	
7.2.3 Blood Glucose	
7.2.4 Diabetes	
7.2.5 End of Topic Test - Homeostasis and Hormones	

History Knowledge Organiser: Health & Medicine

Key Question 1: What have been the cause so illness and disease over time?

MEDIEVAL AND EARLY MODERN PERIODS : c.1300s-1700s

General causes of illness and disease in the medieval period

- Poor diet - bad harvest meant hunger; only 25 per cent of families could feed themselves; malnutrition was common.
- Living conditions - In towns, houses were crowded together, water was taken from streams contaminated with waste, floors were covered in straw which was the perfect breeding ground for rats, fleas and lice.
- Famine - the harshest famine in England was in 1315–17 when torrential rain ruined planting and harvesting.
- War - Wounds inflicted by sword or axe often became gangrenous; e.g. in the Wars of the Roses 1455-1485.

Problems in the medieval era

- Medieval people did not know the link between disease and germs.
- Towns were often filthy.

Plague

Towns were breeding grounds for infection and vermin so there were outbreaks of plague from 1348 to the Great Plague of London in 1665.

There were two types of plague

1. Bubonic plague was spread by fleas from black rats. Swellings called buboes appeared in the armpits and the groin, followed by fever, headache and boils all over the body; death occurred within a few days.
2. Pneumonic plague was spread by people breathing or coughing germs onto one another; the disease attacked the lungs, causing breathing problems and coughing up blood; death occurred quite quickly.

The Black Death entered Britain in July 1348. By the end of 1349 it had spread across England, Wales and Scotland. Up to 40 per cent of the UK population was killed by the disease. In 1665, around 100,000 people died of the plague in London. That was nearly 25 per cent of the population.

INDUSTRIAL PERIOD : c.1800s

The Industrial Revolution resulted in the spread of factories and the growth of industrial towns and cities such as Glasgow, Manchester, Birmingham and Sheffield. Factories needed housing to be built for workers.

Public health problems in industrial towns -

- Squalid living conditions meant that outbreaks of disease were common.
- Tenements were overcrowded, large families lived in cramped conditions.
- Sewage contaminated drinking water, which led to outbreaks of cholera and typhoid; people did not know infected water spread cholera germs.

People in this period thought it was miasma, terrible smells, that caused disease. This is why they were so worried about events like the Great Stink in London in 1858 when sewage made the River Thames smell during the summer heat.

Dr John Snow proved that cholera was a waterborne disease after his study of the Broad Street Pump in London in 1854.

Key words

Tenement - A large building divided into separate flats.

Cholera - An acute intestinal infection which causes severe diarrhoea and stomach cramps, caused by contaminated water or food.

Typhoid - A serious infectious disease that produces fever and diarrhoea, caused by dirty water or food.

MODERN PERIOD : c.1900s-present day

The spread of bacterial and viral diseases in the 20th century

In the 20th century, bacterial and viral diseases continued to spread as there was increased travel between countries, migration and two world wars.

Case study 1: Spanish Flu, 1918–19 - In 1918, a pandemic spread around the world. Up to 40 million people died from this strain of bird flu. It infected 20% of the world's population. The end of the First World War helped transmit the disease as returning troops spread it to the civilian population. 7 million deaths were reported in Spain, so the disease was called Spanish Flu. It could kill a person in a day. Hospitals could not cope. It killed 280,000 people in the UK.

Case study 2 : Tuberculosis - spread by coughs or sneezes. It used to be known as consumption as sufferers gradually lost weight. It was associated with poor housing and unhealthy working conditions of the Industrial Revolution. 'Fresh air' was thought to be the cure. By the 1950s better sanitation and vaccination reduced cases significantly. Isolation hospitals were set up in the countryside *[WELSH EXAMPLE – Penley Hospital in the 1960s]* to help prevent the spread of the disease, but also to provide fresh air to help sufferers recover. The rise of drug-resistant strains in the 1980s, particularly amongst the homeless, means that the fight against TB continues.

Case study 3: The HIV/AIDS threat - In 1981, the first cases of AIDS were reported in the USA. The AIDS virus is spread through the blood or body fluids of infected people – via sexual contact or by sharing injection needles with an infected person. In AIDS a virus called HIV destroys the body's immune system. The victim does not die of AIDS but of other infections that their body can no longer fight. By 2000 an estimated 30 million people were infected with AIDS, the worst affected area was Africa. By 2000 over 8 million people had died because of AIDS.

21st century Lifestyle diseases

New kinds of diseases have also begun to affect people in the modern era.

- As people are living longer so they become more prone to get cancer – one in three people in the UK will be affected by it at some point in their lives.
- Lifestyle changes like increasing smoking of cigarettes and drinking of alcohol have also led to a growth in obesity, diabetes and certain kinds of cancers which did not affect people in earlier times.

Key words

Pandemic - A disease that spreads across a wide geographical area.

AIDS - Acquired Immune Deficiency Syndrome.

HIV – Human Immunodeficiency Virus.

History Knowledge Organiser: Health & Medicine

Key Question 2: How effective were attempts to prevent illness and disease over time?

MEDIEVAL AND EARLY MODERN PERIODS : c.500s-1700s

Medieval attempts to limit the spread of the Black Death -

- Travellers were quarantined, infected families were boarded up in their homes.
- Believed scented flowers or buckets of dung helped avoid bad air (miasma).
- Some took potions believing they would kill off the plague.
- Doctors wore hoods, with a beak stuffed with herbs or sponges soaked in vinegar.
- Flagellants whipped themselves so that God would not punish them further.
- Others disinfected their house with herbs and burned the clothes of victims.

Alchemists tried to use alchemy to make metals turn into gold, and an 'elixir of life' to make a person immortal or forever youthful. In their experiments they laid the foundation for the development of chemistry as a scientific discipline.

Physicians trained at a university medical school in Italy or Paris and used a urine chart and 'zodiac man' charts. Very few knew much about preventing disease, because they did not know about the causes of disease.

Most people depended on the local **'wise woman'** or **soothsayer** who had built up knowledge of sickness and disease over several generations and each would have their own favourite methods. They would collect plants and herbs, special stones, anything that might help, and carry this about with them in a willow basket. They would make special charms to protect against evil. Mother Shipton became a famous 15th century soothsayer.

Key Words

Quarantine - Isolation of a person who may be carrying an infectious disease.

Miasma - The 'bad air' they believed carried disease.

Flagellant - A person who whips himself as part of a religious penance.

Alchemy - A type of chemistry in the medieval era that aimed to find a way to change ordinary metals into gold and a medicine to cure any disease.

Mysticism - The belief that there is a hidden meaning to life.

Elixir - A liquid with magical power that would prolong life indefinitely.

INDUSTRIAL PERIOD : c.1800s

18th century science involved detailed observation, helped by the microscope after 1590. Doctors learned from dissections and used microscopes. Medical books of the ancient writers were proved wrong or new discoveries.

Smallpox and inoculation - Smallpox had a high death rate and no cure. Inoculation involved spreading matter from a smallpox scab onto an open cut on a healthy person's skin, giving them a mild dose of the disease. Inoculation became popular but it was not completely safe.

Smallpox and vaccination – Dr Edward Jenner experimented to find out why milkmaids suffered from cowpox but never smallpox. In 1796 he injected James Phipps with the pus from the sores of a milkmaid with cowpox. Phipps developed cowpox but did not develop smallpox. Jenner had found a way of making people immune from a deadly infectious disease. He called this method vaccination (after the Latin word *vacca* - cow). His book on vaccination was published in 1798.

Many doctors objected to vaccination as they made a lot of money from inoculation. In 1852 smallpox vaccination was made compulsory for all children. Many parents objected. People still believed miasma caused smallpox – Pasteur did not come up with his vaccination theory until 1880 [see KQ4]

The discovery of antibodies and developments in the field of bacteriology - Robert Koch began to identify the bacteria that caused specific diseases starting with TB in 1882. This new science was called bacteriology. Koch and his team went on to find the germs for cholera, typhoid, diphtheria, pneumonia, tetanus and plague which enabled vaccinations to be created to prevent these killer diseases.

Koch realised antibodies could destroy bacteria and build immunity against the disease. Each antibody only worked one bacteria. If you could introduce a weakened form of the disease into the body when the deadly version of the disease attacked, the body would be able to resist. Koch won a Nobel Prize in 1905.

Key Words

Vaccination - Injecting a harmless form of a disease into a person to prevent them from getting that disease.

Bacteriology - The study of bacteria and how to deal with them.

Antibody - A natural defence mechanism of the body against germs.

MODERN PERIOD : c.1900s-present day

In the 20th century, endemic diseases and childhood killers such as diphtheria (1940), polio (from 1955), whooping cough (1956) and measles (from 1963), have almost been eliminated through vaccination programmes.

The World Health Organization (WHO) says vaccines are available for 25 different preventable infections and has campaigns of immunisation operating across the globe. In 1979, WHO declared smallpox extinct.

By the 21st century vaccination fell as a growing reluctance to have children vaccination after the MMR (Measles, Mumps, Rubella) vaccine scandal in the 1990s when Dr Andrew Wakefield wrongly claimed the vaccine caused autism in children.

Around the world the Anti-Vax movement has spread over social media trying to persuade people that vaccination is wrong or too dangerous.

Government attempts to improve public health and welfare in the 21st century [KQ6 for more details]

In the 21st century, governments and agencies have put more and more effort into health education to persuade people to live healthier lifestyles eg. cutting down cancer rates, persuading people to stop smoking, reducing heart disease by encouraging people to get more exercise or reducing obesity and diabetes by encouraging people to at more healthily.

History Knowledge Organiser: Health & Medicine

Key Question 3: How have attempts treat illness and disease changed over time?

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History Knowledge Organiser: Health & Medicine

Key Question 4: How much progress has been made in medical knowledge over time?

MEDIEVAL AND EARLY MODERN PERIODS : c.1300s-1700s

Medieval physicians used a variety of sources of information:

- Examining a patient's **urine**; samples were matched against a colour on a urine chart which led to a particular diagnosis.
- **Astrologers** consulted a book called the *Valemecum* or 'zodiac man' charts to work out which treatments could be used at that time.
- Bleeding, purging or forcing patients to vomit was based on the theory of the **Four Humours** was developed by Hippocrates and Galen in ancient times; four important liquids, called humours. which stayed in balance when a person remained healthy; treatment involved getting the humours back into balance.

The 16th century Renaissance in learning led to the invention of the printing press in Germany and new scientific inventions like the thermometer and microscope, both of which helped improve medical observation.

Andreas Vesalius, Professor of Anatomy at Padua University in Italy, dissected corpses to understand human anatomy. In 1543, he published *The Fabric of the Human Body*, with detailed anatomical drawings. His insistence on dissection of human, not animal, bodies introduced new scientific methods of investigation.

Ambroise Paré was an army surgeon. Wounds were cauterised with boiling oil after amputations, sealing the arteries with a red-hot iron. Paré discovered that wounds healed more quickly if covered with bandages and the ends of arteries were tied using silk ligatures. In 1575, Paré published *The Collected Works of Surgery* - research on amputations, setting fractures and the treatment of wounds.

William Harvey studied medicine in Cambridge before becoming a doctor and a lecturer in anatomy. Harvey believed in the importance of observation and experimentation. By dissecting live animals to study the movement of the muscles in the heart, he proved that blood flowed around the body, carried away from the heart in arteries and returned to the heart in veins. He proved that the heart acted as a pump. In 1628 he published his findings in his book, *Motion of the Heart*.

Key Words

Humours - Four liquids (phlegm, blood, black bile and yellow bile) in the body, that were related to the four seasons and to the four elements (air, fire, earth and water) and believed to cause illness when they became unbalanced.

Anatomy - The study of how the human skeleton fits together.

Dissection - Cutting open and examining the structure of a dead body.

Cauterise - A method of treating amputated limbs or wounds by burning them with a hot iron or oil to prevent infection, stop the bleeding and seal the wound.

Ligature - A thread tied around a vessel to constrict the flow of blood.

INDUSTRIAL PERIOD : c.1800s

19th century doctors believed in spontaneous generation – fumes (miasma) given off by decaying material caused disease to spread. Improvements in microscopes in the late 17th century had already led to the discovery of micro-organisms.

Louis Pasteur carried out scientific research at several French universities before being appointed Professor of Chemistry at the Sorbonne University in Paris in 1867. His most important research included:

- Pasteurisation – boiling the liquid killed harmful germs. It was soon used to stop milk turning sour, as well as beer, wine and vinegar going bad.
- Germ theory – microbes in the air caused decay; in 1861, Pasteur published his 'germ theory' based on his experiments.
- Vaccination theory – in 1879, Pasteur injected chickens with a weakened form of chicken cholera by accident and they became immune, discovering how vaccines work; he did the same for anthrax (1881) and rabies (1885).

Robert Koch was a German doctor who could link bacteria to a particular disease. By 1875, he had identified the bacteria that caused anthrax. In 1878 he did the same for septicaemia (blood poisoning) He stained bacteria so they could be seen under a microscope, and bred bacteria for study. He identified the TB and cholera bacteria. Koch was a pioneer of this new science of 'bacteriology'. The German government to set up the Institute of Infectious Diseases in Berlin in 1891. In 1905 he was awarded the Nobel Prize for his research.

Paul Ehrlich, student of Koch, developed Salvarsan 606 in 1910 as a treatment for syphilis. It was a 'magic bullet', designed drug to target a specific germ.

Key Words

Pasteurisation - The process of heating liquids to destroy harmful micro-organisms.

Chicken cholera - An acute infection of the bowels seen in chickens.

Anthrax - A highly infectious and often fatal disease affecting cattle and sheep.

Rabies - An acute infectious disease of the nervous system spread by the saliva of infected animals.

Tuberculosis (TB) - a serious infectious disease that affects the lungs.

MODERN PERIOD : c.1900s-present day

X-rays - In 1895, Wilhelm Röntgen, Professor of Physics at the University of Würzburg in Germany, discovered X-rays. He realised they would pass through paper, wood, rubber and human flesh but not through bone or metal. Surgeons could see inside the patient without surgery. X-rays really became important during the First World War, enabling doctors to locate deeply lodged bullets and shrapnel inside the bodies of soldiers. Marie Curie developed mobile X-ray units which could be used nearer the front line, making diagnosis and treatment of injured soldiers quicker and easier.

Ultrasound and MRI scans - The second half of the 20th century saw the development of a new range of scanning techniques, which transformed doctors' abilities to see inside the body:

- Ultrasound scanning has developed since the 1950s using high frequency sound to produce 3D images of the inside of the body.
- First used in 1977, the magnetic resonance imaging (MRI) scanner uses a strong magnetic field to create pictures of features inside the body in a computer.

DNA and genetic research – Francis Crick and James Watson explained the structure of DNA in 1953. The Human Genome Project was set up to identify the role of each of the 100,000 genes in a human DNA molecule. It was completed in 2003 and provided the complete genetic blueprint of a human being. As a result of the work on DNA, scientists identified that the causes of some illnesses are genetic. Genetic screening and testing has been used for preventing disease. Work continues on gene therapy, using genes from healthy people to cure the sick.

Key Words

X-ray - A picture produced by exposing photographic film to X-radiation (made up of X-rays), a form of electromagnetic radiation; doctors use these images to see the bone structure of parts of the body.

DNA - Deoxyribonucleic acid, the molecule that genes are made of.

Genetics - Study of what genes are, how they work and how they are passed on.

Genome - Complete set of genes that an individual organism inherits.

History Knowledge Organiser: Health & Medicine

Key Question 5: How has the care of patients changed over time?

MEDIEVAL AND EARLY MODERN PERIODS : c.1300s-1700s

Medieval patient care

1. Monasteries - the infirmary was a type of hospital ward for sick patients, separated from the rest of the monastery to stop infection spreading.
2. Hospitals were run by monks and nuns (named because they offered 'hospitality' - shelter to travellers, the poor and elderly to stay); there were no doctors within these hospitals; monks would pray for the souls of the patients while the nuns looked after the welfare of the patients with herbal remedies.

Voluntary charities in the 16th century - Henry VIII ordered the dissolution of the monasteries in the 1530s, most hospitals closed as well. Some were taken on by voluntary charities or town councils took over.

In London, 5 major hospitals were endowed with royal funds to care for the sick and poor e.g. St Bartholomew's Hospital serving the poor of the area of West Smithfield and St Mary Bethlehem which looked after the mentally ill.

Endowed hospitals in the 18th century – Population growth increased demand for hospitals. Wealthy industrialists paid for them e.g. Thomas Guy, a wealthy printer and bookseller who financed the establishment of Guys Hospital in 1724.

11 new hospitals were founded in London and a further 46 across the country in the growing industrial towns and cities, including Westminster Hospital in London, Addenbrooke's Hospital in Cambridge and the Royal Infirmary Hospitals in Edinburgh and Manchester. The Bluecoat Hospital in Chester opened in 1717.

INDUSTRIAL PERIOD : c.1800s

Hospitals became centres for treating illness with herbal remedies, performing simple surgery and dispensing medicine. Treatment was usually free.

The professionalisation of nursing - The quality of nursing in hospitals was generally poor as they lacked training or medical knowledge.

Florence Nightingale was a pioneer in the way she improved standards of patient care. Between 1854 and 1856, Britain fought Russia in the Crimean War; on hearing about the poor treatment of British soldiers in the military hospital at Scutari in the Crimea, she borrowed money from the government to travel there. She found patients suffering from cholera and typhoid, housed in filthy wards.

She cleaned the wards and patients were given a regular wash, clean clothes and a change of bedding. To prevent the spread of disease, patients were separated according to their illness. The death rate went from 42 in 100 to 2 in 100.

On her return to England in 1856, she began a campaign to reform army medical services; she called for purpose-built hospitals with trained nurses, clean floors, plenty of light and fresh air and better food. In 1859, Nightingale published *Notes on Nursing*. The Times newspaper's Florence Nightingale fund raised £50,000.

In 1860, Nightingale used this money to set up training schools for nurses at St Thomas's Hospital and at King's College Hospital in London; the training was based on her principles of patient care. New hospitals like the Royal Liverpool Infirmary were built to her 'pavilion' design from *Notes on Hospitals* (1863). By 1900, nursing had become recognised as a profession.

MODERN PERIOD : c.1900s-present day

Early 20th century reforms - Liberal governments of 1906–14 introduced welfare reforms designed to help people who fell into difficulty through sickness, old age or unemployment. The reforms included medical inspection of school pupils (1907), free school meals (1906), and old age pensions (1908). The National Insurance Act (1911) meant workers and employers making weekly contributions to give workers sickness benefit and free medical care from a doctor. It did not cover families (wives and children), the unemployed, the elderly.

The NHS - The Beveridge Report of 1942 identified 'disease' as one of the 'Five Evil Giants' and suggested that there should be a free national health service.

Bevan faced opposition to his National Health Service Act 1946 from (a) the authorities that ran hospitals and (b) the British Medical Association (BMA) who complained that doctors would make less money; he overcame this opposition.

From 28 July 1948, the NHS offered a range of services. The demand for health care under the new NHS went well beyond original predictions. In 1947, doctors issued 7 million prescriptions per month; by 1951 the figure was 19 million per month. By 1949, 8.5 million people had received free dental treatment.

Poorer people now had free access to medical treatment which previously they could not afford. The NHS has played an important part in prevention as well as cure; it has launched health campaigns to warn of the dangers of smoking, drinking alcohol and the lack of a healthy diet.

Services provided by the NHS - GP services, ambulances and Accident & Emergency Departments, hospital care (tests, treatment, operations), pharmacies, mental health services, social care (children, the disabled, the elderly), dentists, opticians.

Huge demand for prescriptions, glasses and dental treatment led to the introduction of charges in the 1950s. The NHS prolongs the lives of people, but older patients are more likely to need treatment. New scanning techniques and drugs have also increased the cost of running the NHS.

History Knowledge Organiser: Health & Medicine

Key Question 6: How effective were attempts to improve public health and welfare over time?

MEDIEVAL AND EARLY MODERN PERIODS : c.500s-1700s

In medieval times, mortality rates were higher in the towns than in the countryside as people lived closer together, alongside their animals and their filth. Important improvements in public health in medieval times:

- Monasteries like Tintern Abbey followed strict rules of cleanliness.
- Towns began to build provided **public latrines** (toilets) often placed on bridges. By the 15th century, London had over a dozen.
- London produced about 50 tons of excrement per day, so **muck-rakers** were hired to clean the streets. They were paid much better than the average working man. There were also **gong farmers** who cleared out cesspits.
- Towns had bath houses, eg Southwark, in London, had 18 hot baths. Even smaller towns would have bathhouses, often connected to bakeries.
- Towns introduced **quarantine** laws to combat plague, boarding up houses of infected people. People with leprosy, likewise, were confined to lazar houses.
- Crusaders brought back **soap** from the Middle East to Europe.

There were several attempts to improve public health in the 16th century:

- Henry VII passed a law forbidding slaughterhouses within cities or towns.
- Henry VIII passed an Act of Parliament giving towns and cities the power to impose a tax in order to build sewers.

London was not a healthy place to live. There were outbreaks of the plague in 1563, 1575, 1584, 1589, 1603, 1636, 1647, and the biggest outbreak of all in 1665. After the Great Fire of London in 1666, an Act of Parliament was passed to limit fire destruction by making streets wider and by insisting houses were built of stone with tile or slate roofs.

INDUSTRIAL PERIOD : c.1800s

Local and central government were not interested in public health. Serious outbreaks of cholera in 1832 and 1849 forced the government to investigate living conditions in the rapidly expanding industrial towns.

Edwin Chadwick - In 1839 he was asked to lead a Royal Commission into living conditions for working people. In 1842, he published his Report on Sanitary Conditions. His report shocked people but the government was not ready to act.

The 1848 Public Health Act set up a Board of Health run by three commissioners to set up local boards of health in areas with high death rates. 182 towns had set up their own local health board by 1854. The cholera epidemic of 1848–49 increased interest in public health reform. It did not force local authorities to do something.

More improvements in public health:

- In 1859, Joseph Bazalgette began building London's new sewage system; this dumped the capital's sewage downstream, away from the city.
- Sanitary Act 1866 forced local authorities to construct sewers.
- Public Health Act of 1875 made it compulsory for local councils to lay sewers.
- Artisans' Dwellings Act of 1875 gave councils the power to clear slums.

MODERN PERIOD : c.1900s-present day

[See KQ5 for welfare 1906-1914 welfare reforms]

Attempts were made during the 20th century to improve housing conditions:

- In 1918, the Prime Minister, David Lloyd George, promised to clear away slum housing and replace it with 'homes fit for heroes'.
- Housing Act of 1919 gave grants to local councils to build homes, so estates of council houses were built all over the country.
- Mass demolition of back-to-back housing began in the 1920s.
- Beveridge Report of 1942 identified 'squalor' as one of the 'Five Evil Giants' to be tackled by building 'more and better homes'.
- After WW2 there was a housing shortage so grants were given to build new homes and charge low rents; 1.25 million new homes were built by 1951.
- In the 1960s, many inner-city slums were replaced by high-rise blocks of flats.

Air Pollution - air quality in towns and cities was heavily polluted. London experienced frequent smog. In December 1952 the '**Great Smog**' fell over London, so thick it stopped trains, cars and public events. 4,000 people died of respiratory illness. The **Clean Air Act of 1956** encouraged the use of cleaner coal, electricity and gas for heating. It also tried to relocate power stations away from cities. This only temporarily solved the problem of air pollution as a huge increase in car ownership created a new source of pollution – exhaust fumes. In 2003 London introduced the **congestion charge** to persuade drivers not to go into central London and other towns and cities introduced "park and ride" schemes. In 2018 the United Nations warned that there were dangerous levels of air pollution in UK.

Local and national government health campaigns in the 21st century - Government realised it is better to spend money on prevention than having to spend money on curing diseases that could be prevented, e.g. if people stopped smoking this would save the NHS millions of pounds each year.

- 'Walking for health' is a fitness drive to encourage people to take more exercise, to walk 10,000 steps a day, at a moderate to fast pace. 'Be Active' is Birmingham City Council's scheme to provide free leisure services.
- Fruit and vegetables reduces your risk of heart disease and cancer – the 'Five A Day' and the Eatwell Guide tried to get people to eat a balanced diet.

History Knowledge Organiser: Development of the USA
Exam Questions

1. Similarities and differences… 4 marks

Use Sources A, B and C to identify one similarity and one difference in attempts to prevent the spread of illness and disease over time.

2. Which of the sources is the more reliable to an historian studying… 6 marks

Which of the sources is more reliable to an historian studying attempts to cure illness and disease over time?

3. Describe the development of… 5 marks

- Describe the development of the nursing profession over time.
- Describe the development of surgery over time.

4. Explain why… 9 marks

- Explain why sanitary conditions in hospitals improved in the 19th century.
- Explain why understanding of germs and bacteria improved in the 17th and 18th centuries.

5. Outline how… 16 marks

- Outline how treatment of illness and disease changed from c500 to the present day.
- Outline how the causes of illness and disease changed from c500 to the present day.

MSN 2020

T6

Find a playlist of explainer clips by scanning or clicking the QR code

CLICK ME

SCAN ME

Development and resource issues

Geography Knowledge Organiser

6.1.1 - Measuring development

Measures of development

Gross domestic product (GDP) - the total value of all goods and services produced within a country
Gross National Income (GNI) - (per capita) average wage per person
Employment structure - the type of work people do (for example, primary, secondary, tertiary)
Poverty - the % of the population that earn less than $1.90 a day

Limitations of these measures
They only measure wealth and not social factors (like life expectancy)
They do not show inequality in country (gap between rich and poor)
They do not show the cost of living (ie. the amount that can be bought with the average wage)

Development continuum

A development gap exists between richer and poorer countries. The "Brandt" line splits the world into more developed "global north" countries and less developed "global south" countries.

Less developed — More developed
LIC — Lower middle — Upper middle — HIC

However, the Brandt line is a bit too simplistic. In reality there is a **"development continuum"**. This is a sliding scale from super rich countries to the very poor. The World Bank splits countries into 4 categories based on their Gross National Income (GNI):
HICs with GNI of $12,736 or above
Upper Middle Countries with GNI between $4126 and $12735
Lower middle countries with GNI of $1046 to $4125
LICs with GNI of $1045 or less

6.2.1 - Uneven development

Causes of uneven development

Trade involves buying goods from other countries (imports) and selling them (exports)
HICs generally export valuable goods such as electronics, cars and financial products. They import cheaper primary products like tea, sugar and coffee.
LICS do the opposite. This means they earn little and remain in poverty

The prices of these products go up and down but HICs tend to have the biggest influence over them. LICs lose out when the price drops, but have little control over it. Increasing this trade and changing the balance of imports/exports is essential for LICs to develop. Some HICs impose tariffs (import costs) and quotas (a limit to the amount of imports) which also affects LICs.

Multinational corporations (MNCs)

MNCs have grown as a result of globalisation. Often they are free to decide where they locate many aspects of their company. The headquarters if usually found in a global city such as London. However, other parts of the company can be located around the world. Factors like, government incentives, location of raw materials, labour costs and reduced costs for buildings and land make a difference.

Advantages of MNCs in LICs	Disadvantages of MNCs in LICs
Created jobs and improved local skills	Investment could be transferred to other countries quickly
Pays higher wages than most local Companies	They has large demand for energy/water
Helped attract more MNCs	They have reputation for workers abuse
Contributes to tax which helped pay for schools, hospitals etc.	They might undermine national culture

6.2.1 - Uneven development

Tourism

As a result of globalisation the tourist industry has grown rapidly. It now accounts for 1-in-11 jobs worldwide. It is increasingly becoming important for low and middle income countries. Rapid growth is due to:
Early retirement & higher life expectancy mean people can spend time travelling
People earn more so have more disposable income
Modern aircraft make is cheaper and quicker
The internet allows people to research destinations

Mass tourism
Where tens of thousands of people going to the same resort often at the same time of year

Enclave tourism
Where tourists pay one price and get all travel, accommodation, food and drink in one place

Cruise holidays
Cruise ships sell all inclusive packages

Advantages of tourism in LICs	Disadvantages of tourism in LICs
Employs thousands directly and hundreds of thousands indirectly, bringing billions to the economy	Many tourist development are partly owned by foreign companies. Some profits leak (send) overseas
Tourism is encouraging new skills and improving language skills of locals	Jobs are seasonal, many people lose their jobs in the wet or winter season
New services such as transport can be used by tourists and locals	The growth of sex tourism can become an issue in some countries
New national parks are being created to protect wildlife and encourage tourism	The arrival of tourists can cause a decline in local cultures, for example loss of language or religious traditions

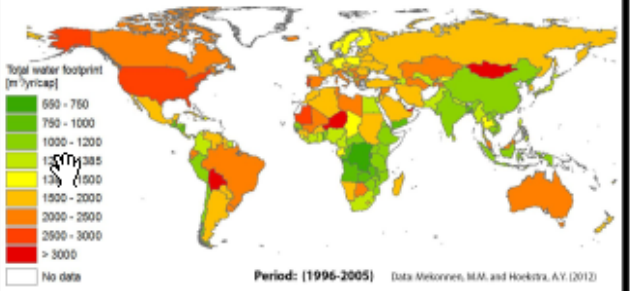
6.2.2 - Managing development

Aid

Aid is the transfer of resources from a richer country to a poorer country. Different types of aid include:
Bilateral aid - between two countries
Multilateral aid - money donated by richer countries via organisations such as the UN
Short term emergency aid - immediate relief following a natural disaster
Long term development aid - a sustained programme of aid which aims to improve the standard of living
Debt abolition - when richer countries cancel debt owed by poorer countries
Aid from non-governmental organisations (NGO's) - given through charities such as Oxfam.

Advantages of aid for LICs	Disadvantages of aid for LICs
Emergency aid saves lives and reduces misery	Aid can increase dependency on the donor country
Development aid can lead to long term improvements and increase standards of living	Profits from the large projects can go to multinationals and donor countries
Assistance in developing natural resources benefits global economy	Aid doesn't always reach the people who need it and can be kept by corrupt officials
Aid for industrial development creates jobs and aid for agriculture increases food supply	Aid can be spent on prestige projects in urban areas rather than in the areas of real need
Provision of medical training and supplies improves health	Aid can be used as a weapon to exert political pressure on the receiving country

6.3.1 - Water demand



The global consumption of water is rising. This is because:
Population is rising
Economic development - The more developed a nation the more water used
Increased need by agriculture - irrigating crops
Industrial growth - As more MNCs invest in NICs and LICs the more water needed
Consumerism - HICs use appliances like dishwashers and washing machines

Water footprint - a measure of humanity's use of fresh water and/or polluted
We don't just use water to drink and for hygiene reasons. 70% of our water is used to produce food (crops & animals). Industries use water in 'cooling processes'. Water is need in thing like clothing - fabrics have to be grown.

Water security - the capacity to safeguard the sustainable availability and access to drinking water
The UK generally have excellent access to water all year round. Some places don't, where water isn't clean or alway available. Sometimes it's too expensive to transport or access (economic scarcity) or it's not available due to droughts (physical scarcity).

6.3.2 - Water sustainability

Dams: Dams block the flow of a river, creating a large reservoir to the rear which can be used all year round. Dams can be expensive to build, and the reservoir may flood local settlements and ecosystems.

Water transfers: When water is transferred to from an area that has a surplus of water to an area that is experiencing a shortage. This may be conducted within a country, but it can also be conducted from one country to another. For example, Lesotho transfers water to areas of South Africa experiencing physical water scarcity.

Desalination plants: Desalination is the process by which salt is extracted from water. At these plants, salt is removed from seawater to make it safe to drink. Such plants are extremely expensive to run.

Water conservation: This is when an attempt is made to actually use less water in the first instance. For example, many toilets have dual-flush systems to reduce the amount of water used. In addition, meters may be installed within households so residents can check their water usage

Over-abstraction of groundwater

India is a country that is over extracting its groundwater (the water table is 4m lower than in 2000)

Reasons for this
Some states like Gujarat have a long dry season
Surface stores (like reservoirs) are often polluted
Cheap electricity has encouraged farmers to dig deeper wells
Solutions
The government can build more dams (this is an example of top down development)
Farmers could be encouraged to conserve water e.g. rainwater harvesting (this is bottom up development)

6.4.1 - NIC regional development

India's regional patterns

Northeast has higher levels of poverty (over 30% of people)

South has the least levels of poverty (less than 10%)

The east generally has lower levels of poverty (around 15%)

GDP per region in India

Physical reasons

Northern India is more mountainous and dry, so it has poor soil and climate to grow crops. **The south** has a more humid climate with rains.

Political reasons

Kerala (in the south) funds education and encourages families to have fewer children = better quality of life (less pressure on resources)
Kashmir (in the north) has seen conflicts/wars and is in a mountainous area = not very populated, poor access, dry climate.
Maharashtra (in the east) has the capital city and attracts lots of industries like manufacturing and has ports for trade

Cultural reasons

India had a **caste system** (some people had more rights than others). Although it's **illegal** now it still has an impact on people today with types of jobs people can do.

Girls and women are discriminated against particularly in rural areas

6.4.2 - UK regional development

UK's regional patterns

There is a north-south divide in the UK for development. The divide recognises the social and economic differences between Southern parts of the UK (more developed) and the rest of the UK (less developed).

Economic reasons

With the **largest markets located in the south-east**, which also includes **good access to European markets**, companies have greatest potential to **maximise profits by locating in the south.**

Social reasons

With over 20 million people of the UK's population living within a one hour commute of London, many **businesses prefer to locate themselves close to their customers**, and within **commuting distance of their staff.** **Many universities are in the south** of the UK, including Oxford and Cambridge, which provide many workers - who **employers may perceive as being most skilled** and desirable.

Political reasons

Many large companies have headquarters (HQ) in the south-east, making it easier to make crucial decisions. Even though government policy has tried to encourage investment in other parts of the UK it is **still more convenient for other smaller businesses to start up where there is already infrastructure** to support.

6.4.3 - Managing UK development

Positive multiplier effect

Regional inequality can be reduced by investment in deprived areas of the UK. Various strategies have been used in the past which usually includes investing in infrastructure in an area which is deprived to try and promote a **positive multiplier effect.** However, when industries close there is also a **negative multiplier effect.**

National strategies

Giving power to local authorities e.g. regional mayors (Manchester/Leeds)

The **creation of the "Northern Powerhouse"** which is a proposal to boost economic growth in the North of UK, this would attract investment and create skilled jobs in the area

The **improvement of transport links** to the Northern places in the UK. This improves accessibility, attract new investment and therefore may create a positive multiplier effect (eg. HS2)

Relocation of major business and offices, sometimes head offices in other parts of the UK, such as Manchester. This encourages other businesses to invest in the areas

Local strategies (Newcastle)

Newcastle Enterprise Package - supporting new business

Newcastle Science City - a partnership between Newcastle University, Newcastle City Council and the European Regional Development Fund supporting the innovation and technology sectors

The Millennium Bridge - crossing the river Tyne

Home study questions

DEVELOPING

Outline the measures of economic development **[3 marks]**

Give three reasons why LICs receive less money from international trade **[3 marks]**

SECURING

Analyse the pattern of global water usage (water footprint) (6.3.1) **[6 marks]**

Describe what a water footprint is **[2 marks]**

MASTERING

Evaluate which factor/reason (social, economic or political) is the most significant cause of UK regional inequality **[8 marks]**

Decided whether foreign aid is overall a good or bad thing for LIC development **[8 marks]**

CHALLENGE

Create a concept map to show how MNCs and tourism are linked and how these are also linked to uneven development in LICs/NICs

Research how the High Speed railway 2 (HS2) project will have benefits for the north of England

KS4 Spanish TRAVEL AND TOURISM – Theme 2, Unit 8.1: Holidays and travel

SENTENCE BUILDER: Vacaciones y viajes *[Holidays and travel]*

El verano pasado *[Last summer]*

El año pasado *[Last year]*

El fin de semana pasado *[Last weekend]*

El mes pasado *[Last month]*

Hace dos años *[Two years ago]*

Hace dos meses *[Two months ago]*

Hace dos días *[Two days ago]*

Hace dos semanas *[Two weeks ago]*

La semana pasada *[Last week]*

En Semana Santa *[At Easter]*

Durante las Navidades *[During the xmas holidays]*

fui a España… *[I went to Spain]*

en *avión*… *[by plane]*

con mi familia… *[with my family]*

Lo que más me gustó fue que… *[What I liked the most was that]*

Lo que menos me gustó fue que *[What I liked the least was]*

Lo bueno fue que *[The good thing was that]*

Lo malo fue que *[The bad thing was that]*

Lo mejor fue que *[The best thing was that]*

Lo peor fue que *[The worst thing was that]*

un día *[one day]*

otro día *[another day]*

el primer día *[on the 1st day]*

el último dia *[on the last day]*

el segundo día *[on the 2nd day]*
el tercer día *[on the 3rd day]*
el cuarto día *[on the 4th day]*
el quinto día *[on the 5th day]*
el sexto día *[on the 6th day]*

el lunes *[on Monday]*

el fin de semana *[at the weekend]*

alquilé una bici/moto/barco *[I rented a bike/scooter/boat]*
bailé en la discoteca *[I danced in the nightclub]*
cené en un restaurante italiano *[I had dinner in an Italian restaurant]*
comí platos locales muy ricos *[I ate delicious local dishes]*
compré muchos recuerdos bonitos *[I bought many pretty souvenirs]*
compré regalos/ropa *[I bought gifts/clothes]*
conocí a gente local *[I met local people]*
descansé y no hice nada *[I rested and did nothing]*
di una vuelta en barco *[I went on a boat ride]*
di una vuelta a pie por la playa *[I went for a walk along the beach]*
di una vuelta en bici por el centro de Madrid *[I went for a ride on bike in the centre of Madrid]*
fui a la playa/de compras *[I went to the beach/shopping]*
fui de excursión a ver delfines *[I went on a trip to see dolphins]*
hice turismo/escalada *[I went sight seeing/climbing]*
leí libros en la playa *[I read books on the beach]*
me desperté muy tarde *[I woke up very late]*
me acosté muy tarde *[I went to bed very late]*
me quedé/me alojé en un hotel de lujo *[I stayed in a luxury hotel]*
me relajé *[I relaxed]*
nadé en el mar *[I swam in the sea]*
pasé mucho tiempo en la playa tomando el sol *[I spent a lot of time at the beach sunbathing]*
paseé por la playa *[I walked on the beach]*
probé la comida local *[I tried the local food]*
saqué fotos *[I took photos]*
salí con mis amigos *[I went out with friends]*
tomé el sol *[I sunbathed]*
vi espectáculos de flamenco *[I saw flamenco shows]*
vi monumentos famosos *[I saw famous monuments]*
vi un partido en el estadio *[I saw a game at the stadium]*
visité muchos lugares interesantes *[I visited many interesting places]*
visité un museo/castillo *[I visited a museum/castle]*
visité iglesias antiguas *[I visited old churches]*

en el centro de la ciudad había mucha contaminación *[in the city centre there was a lot of pollution]*

el tiempo fue horrible porque siempre hacía mal tiempo *[the weather was horrible because it was always bad]*

algunas partes de la ciudad estaban muy sucias *[some parts of the city were very dirty]*

habían demasiados turistas *[there were too many tourists]*

el hotel era muy sucio y ruidoso *[the hotel was very dirty and noisy]*

fue/era un lugar aburrido *[it was a boring place]*

la gente era antipática *[the people were unfriendly]*

no había ambiente en las calles *[there was no atmosphere in the streets]*

la comida era repugnante *[the food it was disgusting]*

la gente local era antipática y grosera *[the local people because they were mean and rude]*

tuve un accidente en la playa *[I had an accident on the beach]*

perdí mi móvil/pasaporte *[I lost my phone/passport]*

perdí mi maleta *[I lost my luggage]*

perdí mi vuelo *[I missed my flight]*

me robaron la cartera *[my wallet was stolen]*

me puse enfermo *[I was ill]*

me quemé en la playa *[I got sunburnt at the beach]*

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

Allah

- Allah is the one and only creator and controller of everything. God's will is supreme.
- It is haram (not allowed) to create pictures of Allah.
- Tawhid means the 'oneness of God' and is the central belief of Islam.
- The Shahadah expresses the belief that there is only one God.
- It is Shirk to suggest there is more than one God or anything is equal to Allah
- Muslims should accept everything that happens as the will of Allah.
- Muslims use the '99 names of Allah' to describe the character of God eg the Merciful, the Lord of everything, the Divine Source of Guidance

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?

LIFE EVENTS

Relationship changes ← → **(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**

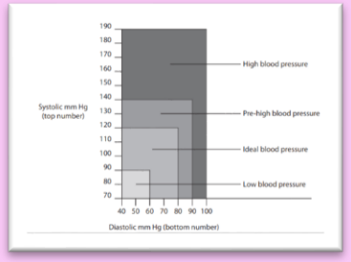
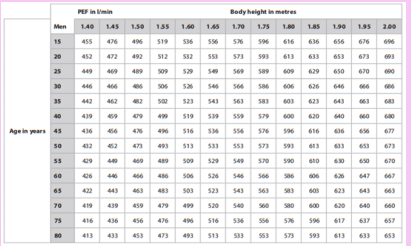
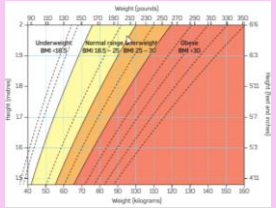
The bigger picture

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.

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

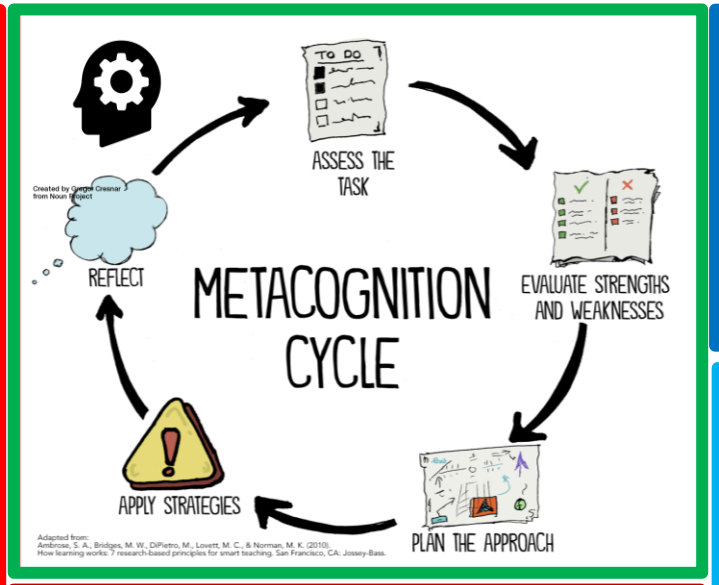
Stimulus
↓
Devise
↓
Perform
↓
Evaluate

REFLECT

Year 11 PSHE Term 1 – Living in the wider world and Health and Wellbeing

Language for Learning

Metacognition
Self-regulation
Raising the participation age
Labour Market information
Career pathway
Work-life balance
Application form
Letter of application
CV (Curriculum vitae)
Personal statement
Interview preparation and techniques
Aspiration
Ambition
SMART targets



Anti bullying week - November

Bullying behaviour is defined as repeated, negative behaviour that is intended to make others feel upset, uncomfortable or unsafe.

How to Prepare for a Careers Interview

Here are some activities you might find helpful to get you used to researching careers related topics:

- Research different careers
- Identify your skills and qualities and suitable careers
- Research the post 16 options that are available
- Make a progression Plan

Labour market information (LMI)

It is information relating to career occupations and industries, such as job numbers and salaries. It can also include a range of more specific details, such as educational levels for occupations, workforce demographics and employment patterns locally and/or nationally.

You can access up to date LMI for Greater Manchester from our website.

National careers service's guidance on writing a CV

A CV is a short, written summary of your skills, achievements and experience. You use it in the first stage of applying for jobs. Employers often ask for a CV instead of an application form. You can do it on paper or online. There are some things that you need to put in your CV. You can change the order of these to suit your situation and the type of CV layout you want to use.

- Contact details
- Personal profile
- Your education history
- Your work experience history
- Hobbies interests or achievements
- References

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.

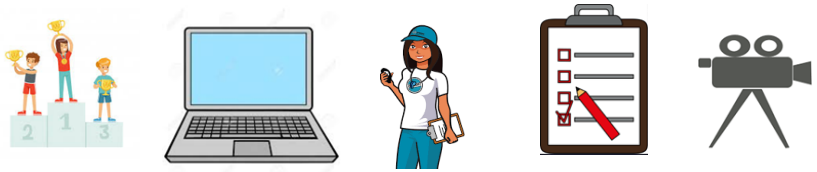
Scoring Systems

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

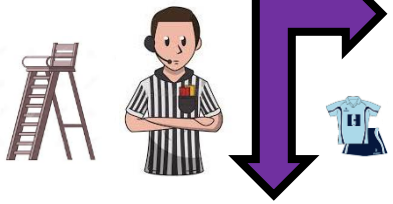
- Strengths and areas for improvement: components of fitness, skills and techniques, specific to the sport and non-specific, e.g. fitness.
- Self-analysis: completion of observation checklist, e.g. use of video.
- Strengths and areas for improvement: tactics, the effectiveness of decision making.
- Activities 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.

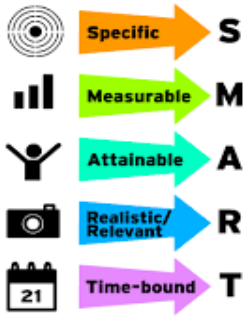
Techniques:- A technique is the method ,technique that procedure a way something is done. An example of techniques being your knees when taking a set shot.

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

Isolated Practices

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

Conditioned practices

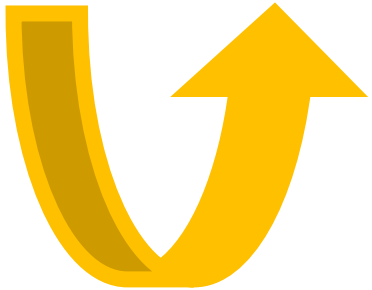
For example, small-sided games, a limited number of touches, a set number of defenders or attackers.

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.

Observation Checklist		Comments:-
Defence		
Speed		
Aerobic Endurance		



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.

SCHOOL LOGO

Unit 6 Leading Sports Activities

Learning Aim A- Know the attribute associated with successful sports leadership

Skills: Communication (verbal, non verbal and listening), Organisation of equipment, knowledge, activity structure, target setting, use of language evaluation.
Qualities- Appearance, enthusiasm, confidence, leadership style (autocratic, democratic, laissez-fair), motivation, humour, personality (introvert, extrovert)
Responsibilities- Professional conduct, health & safety, equality, ethics & values, insurance, child protection, legal obligation, rules and regulations.

Structure of your work

Identify the skill, quality or responsibility
Why are they important?
What would happen if they are unable to demonstrate the skill.
Always back your explanation up with an example of a sports leader who you feel does this well.

(Distinction task) Compare and contrast the attributes of two successful sports leaders

Pick the skills, qualities and responsibilities you feel you can compare the sports leaders effectively.
Similarities of sports leaders
Difference in sports leaders
Do you feel one does something better?
Remember it doesn't have to be someone famous, it could be a PE teacher of old sports coach. Consider who you might feel you can compare as a sports leader, research famous ones or use your own




Learning Aim B- Undertake the planning and leading of sports activities

Every session has 3 areas you must plan for: Warm up, main component e.g. skill introduction/development, conditioned game, cool down.

Plan-Age: What year group, this will most likely be a group of year 7 students.
Ability: Will the students know anything about the sport? Will they have played lots of this before?
Gender: Boys/girls or mixed
Numbers: State on estimate of group size. This is dependent on the year group and how many are in on that day.
Medical: Mention about what you would do if there is a medical emergency, make sure asthmatics have their inhalers, be aware of someone who isn't feeling too well.
Specific needs: What will you do if a couple of students don't work well together.

Aims and Objectives

Aims- What do you want the students to know or do by the end of the 20 minute session?
Expected outcomes: How will you know they have learnt/can perform a skill? What will you ask them in your plenary at the end to check what they have learnt?
Resources
Equipment: What will you need? How much of it will you need?
Time: You will have 20-25 minutes maximum to deliver a session, this will be after students are changed.
Environment: What space will you use? Have a think of a plan B
Health and safety considerations
Risk assessment: What will you do if it rains? What space will you use if the MUGA dangerous or if the grass is too muddy? Where will you leave your equipment when it isn't being used? What will you do if a student has long hair or a piercing in?
Informed consent: This should only be needed if you are taking students off site or getting them to take part in a sport they haven't done.

Learning Aim C- Review the planning and leading of sports activities

Introduction

Outline of the session you delievered e.g. what was the age of the children, how many were involved, what activity did you lead on and what were the aims of the session. How you felt it went, were you happy with the outcome of the session?

Strengths

What were the strengths you identified from your leadership session? You need to identify at least 3 leadership strengths from your session. How did you know these were strengths?

Weaknesses

What were the weaknesses you identified from your leadership session? You need to identify at least 2/3 leaderships weaknesses from your session. What made you feel these were weaknesses during the session?

Targets for development plan

You need to consider aims and objectives suggesting ways in what you are planning to improve you leadership skills using the areas for development you will have explained previously. This will indicate ways in which you can improve these specific skills leaderships skills, along with setting a short and long term goal. When you set targets to improve you should use SMARTER targets.

Specific- It is specific and I know exactly what I want to improve
Measurable- It is clear enough so you can see if it has been improved
Achievable- You should be able to reach this target.
Realistic- Something which is achievable to meet.
Time-related- You have a time length in mind to meet the target
Exciting- It is something your motivated to do.
Recorded- You can keep a record know when you have achieved it.

Learning Aim A- Know the attribute associated with successful sports leadership

Key words

Describe- *Communication is used when a sports leader is talking to a group in the session.*

Explain- *Communication is needed by a sports leader to allow participants to understand what they have been asked to do, if this isn't clear they may be confused and not do the thing that they were asked to do.*

Example- *Jose Mourinho displays effective verbal communication during games to ensure all players know what they are required to do, and uses non verbal communication through the use of a whiteboard to explain tactics prior to a game*

Compare - *Identify the main factors and explain the similarities and differences or advantages and disadvantages*

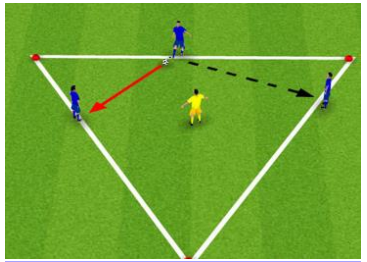
Contrast - *Show differences*

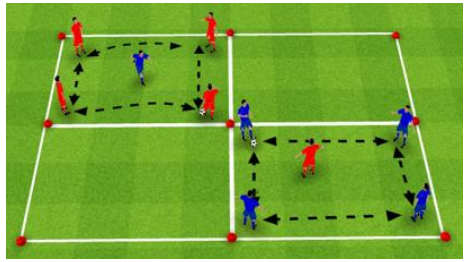
What skills might these sports leaders have?

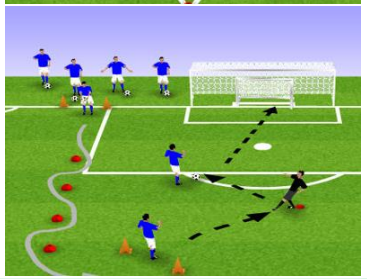
Learning Aim B- Undertake the planning and leading of sports activities

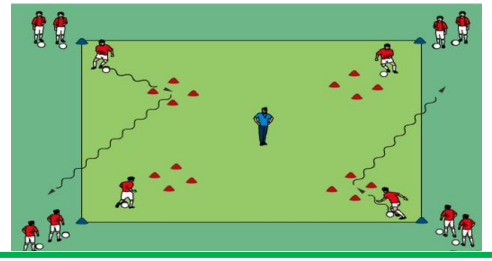
Clear explanations of each specific part of the lesson needs to be completed on a sport of your choice. You can include images shown below of a drill or activity you would like to do, but then explain exactly what will happen.

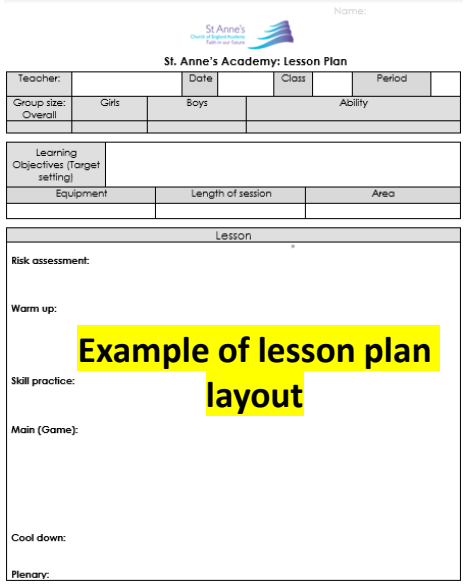
Warm up- This will consist of participants playing stuck in the mud, followed by some stretching. *Justification to state under each activity why you did that? How might this link into the aim of your session?* E.g. I chose to do a small cardio routine (including stuck in the mud) so that the muscles can become warm and therefore they are less prone to serious injury. Following this, I chose to do stretches as part of my warm up in order to increase muscle control, flexibility and range of motion, this prepared my participants for the main session.











St. Anne's Academy: Lesson Plan

Teacher:		Date		Class		Period	
Group size: Overall	Girls	Boys		Ability			

Learning Objectives (Target setting)		
Equipment	Length of session	Area

Lesson

Risk assessment:

Warm up:

Skill practice:

Main (Game):

Cool down:

Plenary:

Example of lesson plan layout

Learning Aim C- Review the planning and leading of sports activities

Firstly, one strength of mine was ***communication***. I spoke clearly, and projected my voice to make sure that everyone I was coaching could hear me and vaguely understand me. I used a lot of different methods when talking to the students, yet it was simple so that they could understand what I wanted them to do in each drill. I didn't use complicated language as not all of the students would get what I wanted them to drill in the drills, and they wouldn't have gained anything from the session.

A weakness of mine was ***knowledge***. I possibly could have gone into more detail explaining the drills as some of the students were struggling with the drills as they got harder, so if I would have explained them in more detail they would have got more out of the session. Also, I didn't know everything about the sport, so I couldn't answer all questions about specific aspects about the sport.

Development Plan

I would like to improve my confidence as a leader overall. I was ok at leading the session but I felt very nervous which made me forget about basic things during the session. If I had players that were more skilled then I feel I would be less confident. I also led a small group which helped me feel better. If I was leading a larger group I don't think my confidence would be good. If I have this as one of my improvement points I will gain confidence the more I lead and with every different group I lead will help this. Also if I practice leading different sports and keep researching their rules and regulations this will build my confidence in leading in general.

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

Landscape

Mixed Media
Mark Making
Observational Drawing
Photos
Drawing
Painting
Printing

Paula Brett

David Tress

Gretchen Kelly

Key Artists

Kurt Jackson

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……

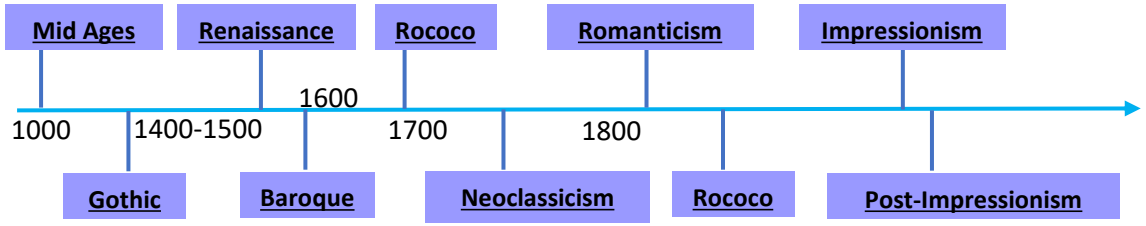
EXTENDED LEARNING

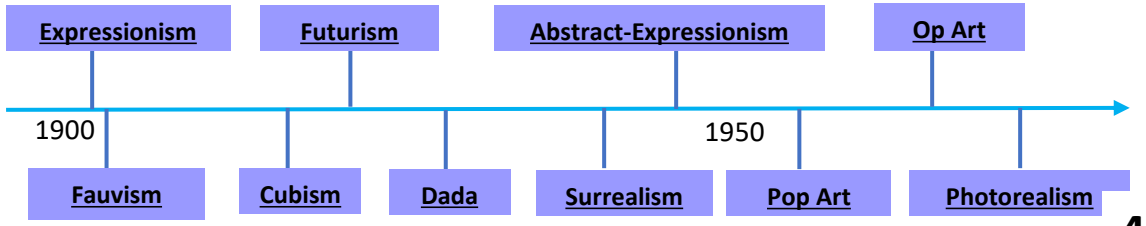
Anything that appeals to you creatively is acceptable to include in your portfolio. For example, if you use Pinterest and you see an image or project that appeals to you then have a go. There are many online exhibitions you can view and galleries you can follow which may also inspire you! Remember, your 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

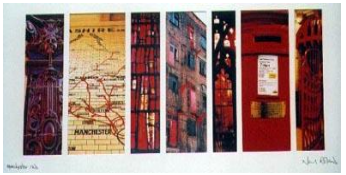
This is the Place by Tony Walsh.

Manchester bands
Suffragettes: Emmeline Pankhurst
Alan Turing: code breaker, computers.
First railway station
Football
Industrial Revolution: Steel Cotton
Unions, libraries, housing
Science- atomic bomb
IRA 1996 bomb. No fatalities

Inspiration from artists

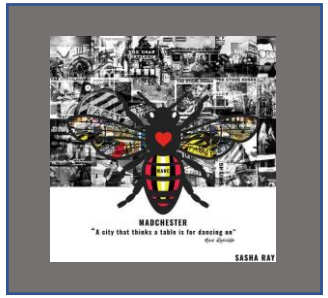
Amy Gibbings
Leading lines
Monochrome
Angles.

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

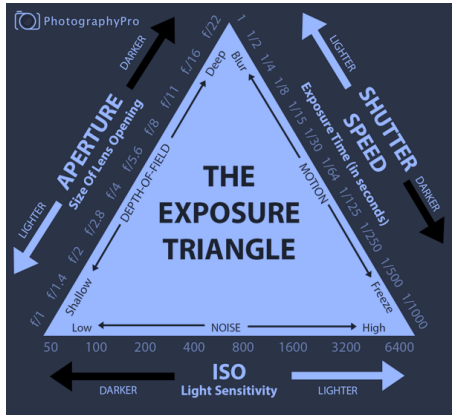

Brush tool


Gradient tool

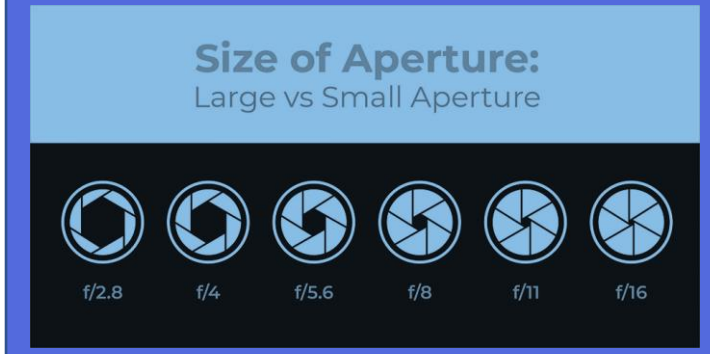

Eraser tool


Pencil tool

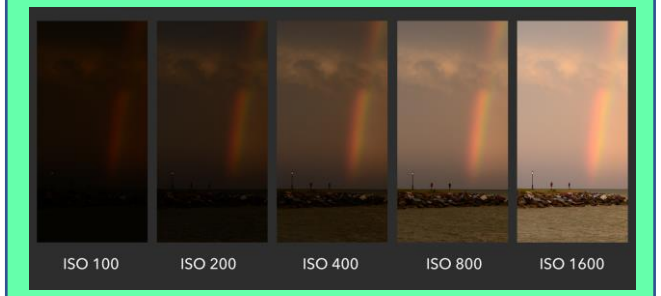
- ISO
- Aperture
- Shutter speed



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.

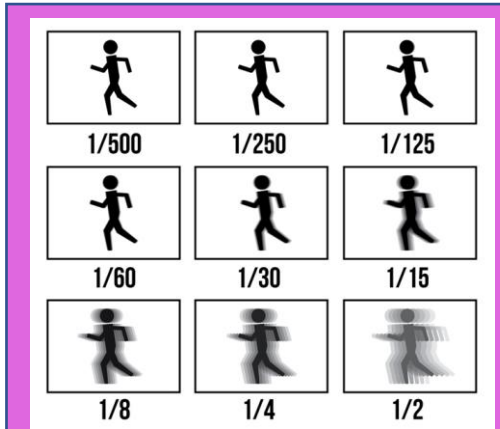


Camera settings



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?

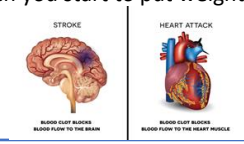
Carbohydrates

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.

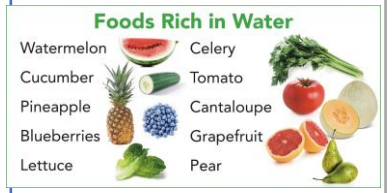
Starchy carbohydrates are better for us because they provide energy for longer and not just a quick sugar rush. Sugary carbohydrates can lead to rotting teeth and obesity. Being obese can lead to strokes and heart attacks.

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	12 non-essential
Body cannot manufacture (make) these.	Can be made by the body.
Must be provided by our diet.	
High Biological Value	Low Biological Value
Animal sources of protein, such as meat, poultry, fish, eggs, milk, cheese and yogurt.	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 (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

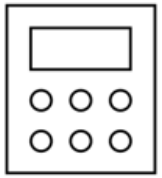
Ergonomics

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:

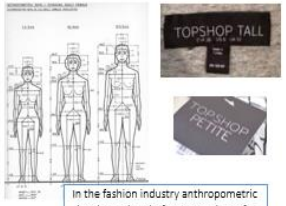
- Arm length
- Head circumference
- Height
- Chest width
- Shoulder height
- Hand width
- Knee Height

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

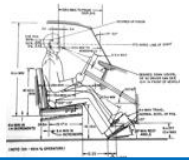
Anthropometrics in Everyday Life

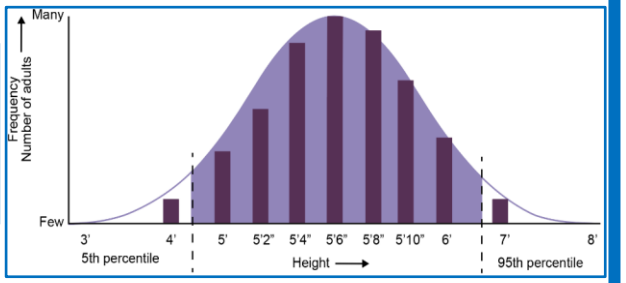
- Anthropometric data is gathered from thousands of people to inform the sizing of many products.
- Manufacturers use this data to produce products that are fit for purpose for the target market.



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?

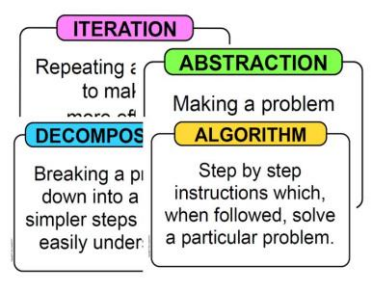
KS4 Computer Science – Year 11 – 2.1 - Algorithms

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*