Year 11
Learning Cycle 2

Student Name:_____

Contents

Masterclass Timetable

	Tuesday	Wednesday	Thursday
Subject	English	EBACC	Maths

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

	Mon A	Tue A	Wed A	Thu A	Fri A
11X1&Y1	English / Option C	Maths	Option A	Science	Option B / Option D
11X2&Y2	English / Option C	Maths	Option A	Science	Option B / Option D
11X3&Y3	English / Option C	Maths	Option A	Maths / Science	Option B / Option D
11X4	English / Option C	Maths	Maths/Option A	Science	Option B / Option D
	Mon B	**Tue B**	**Wed B**	**Thu B**	**Fri B**
11X1&Y1	Maths / Option C	Science	Option A	English	Option B / Option D
11X2&Y2	English / Maths	Science	Option A		Option B / Option D
11X3&Y3	Option C	English / Maths	Science / Option A		Option B / Option D
11X4	Option C	English	Option A	Maths / Science	Option B / Option D

Subject	Homework
English	60 minutes (weekly)
Maths	60 minutes (weekly)
Science (Biology, Chemistry & Physics)	30 minutes (weekly)
Option A	30 minutes (weekly)
Option B	30 minutes (weekly)
Option C	30 minutes (weekly)
Option D	30 minutes (weekly)

How to Use your Learning Cycle Knowledge Organiser

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

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

What are the SORT strategies?

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

How to use SORT

Step 1: Select	Step 2: Organise	Step 3: Recall	Step 4: Test
When you revise for a specific topic use your knowledge organiser, revision guide, website etc to select the key knowledge you need to learn. a. Use the daily planner on page 10 to identify all the times when you will complete your home learning and when you will complete independent revision b. RAG each of the PLCs so you identify your RED topics – the ones that you are unsure of or you do not fully understand c. Write your RED topics into your daily planner for when you will revise that subject.	Organise the knowledge that you have selected using a range of strategies: • Flashcards • Mindmaps • Cornell Notes • Revision Clocks • Summary For more details go to the SORT webpage: https://www.poltairschool.co.uk/sort	Once you have summarized the knowledge, you need to actively memorise it. This is the most important part of the revision process! You could use any of the following strategies to help: • Lietner System • Blurt It • Look, say, cover, write, test	The last step in revision is to be confident that you can recall and retrieve the knowledge. To do this you need to test yourself. Quick and simple ways are to ask someone else to quiz you on the knowledge or to complete an online quiz. You can also answer past exam questions. If you can not confidently recall the knowledge you will need to repeat step 3.

At Poltair we SORT it!

Daily Planner Week A

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

Daily Planner Week B

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

1	2	3	4	5	6	7	8	9	10
11	12	13	POLTAIR Masterclass Pizza Pass! Name:				14	15	16
17	18	19	20	21	22	23	24	25	26
27	28	29	30	31	32	33	34	35	36

Personal Learning Checklists

English – Literature Paper 2, Section A (An Inspector Calls)

Literature Paper 2, Section A (An Inspector Calls)	S	O	R	T
Recalling significant moments in the plot.				
Understanding characters and how they develop throughout the play.				
Understanding key themes (socialism, capitalism, inequality, poverty, gender, responsibility).				
Identifying and analysing language methods.				
Identifying and analysing structure.				
Identifying and analysing features of the play form.				
Recalling key quotations for all characters and themes.				
Understanding how Priestley's beliefs and motivations influence his writing.				
Understanding Priestley's intentions and messages.				
Recalling key information about the Edwardian context.				
Planning thoughtfully sequenced responses to exam questions.				
Writing thesis introductions.				
Developed what, how, zoom, why paragraphs.				
Using a range of references (including quotations) to support ideas.				
Using appropriate connectives.				
Developing analysis with relevant contextual ideas.				
Using a range of sophisticated vocabulary to enhance analysis.				

English – Literature Paper 2, Section B (Power and Conflict Poetry Anthology)

Literature Paper 2, Section B (Power and Conflict)	S	O	R	T
Ozymandias by Percy Bysshe Shelley				
Key ideas and meanings				
Context and purpose				
Language				
Structure and form				
Key quotations				
London by William Blake				
Key ideas and meanings				
Context and purpose				
Language				
Structure and form				
Key quotations				
Extract from The Prelude by William Wordsworth				
Key ideas and meanings				
Context and purpose				
Language				
Structure and form				

Literature Paper 2, Section B (Power and Conflict)	S	O	R	T
The Charge of the Light Brigade by Alfred Lord Tennyson:				
Key ideas and meanings				
Context and purpose				
Language				
Structure and form				
Key quotations				
Exposure by Wilfred Owen				
Key ideas and meanings				
Context and purpose				
Language				
Structure and form				
Key quotations				
Storm on the Island by Seamus Heaney				
Key ideas and meanings				
Context and purpose				
Language				
Structure and form				

Personal Learning Checklists

English – Literature Paper 2, Section B (Power and Conflict Poetry Anthology)

Literature Paper 2, Section B (Power and Conflict)	S	O	R	T
Remains by Simon Armitage:				
Key ideas and meanings				
Context and purpose				
Language				
Structure and form				
Key quotations				
Poppies by Jane Weir:				
Key ideas and meanings				
Context and purpose				
Language				
Structure and form				
Key quotations				
War Photographer by Carol Ann Duffy				
Key ideas and meanings				
Context and purpose				
Language				
Structure and form				

Literature Paper 2, Section B (Poetry Anthology)	S	O	R	T
The Emigree by Carol Rumens				
Key ideas and meanings				
Context and purpose				
Language				
Structure and form				
Key quotations				
Checking Out Me History by John Agard				
Key ideas and meanings				
Context and purpose				
Language				
Structure and form				
Key quotations				
Kamikaze by Beatrice Garland				
Key ideas and meanings				
Context and purpose				
Language				
Structure and form				

Literature Paper 2, Section B (Poetry Anthology)	S	O	R	T
Responding to the Exam Question:				
Choosing an appropriate comparison poem.				
Planning my response effectively.				
Writing a thesis introduction.				
Using quotations and references to support my ideas.				
Identifying and analysing language methods.				
Identifying and structure methods and features of form.				
Making thoughtful connections between poems.				
Using a variety of analytical verbs to support my critical writing.				
Using appropriate connectives.				
Developing analysis with relevant contextual ideas.				

Personal Learning Checklists

English – Literature Paper 2, Section C (Unseen Poetry)

Literature Paper 2, Section C (Unseen Poetry)	S	O	R	T
Reading an unseen poem carefully and identifying the poet's ideas.				
Using quotations and references to support my ideas.				
Identifying and analysing language methods.				
Identifying and analysing structure methods.				
Using a variety of analytical verbs to support my critical writing.				
Comparing methods in two poems.				

English – Language Paper 2

Language Paper 2	S	O	R	T
Question 1: focus, timings and how to answer the question.				
Question 2: focus, timings and how to answer the question.				
Question 3: focus, timings and how to answer the question.				
Question 4: focus, timings and how to answer the question.				
Understanding information and ideas in a non-fiction text (Q1).				
Making inferences about relevant quotations from two non-fiction texts (Q2).				
Analysing language methods (Q3)				
Identifying writers' viewpoints in two non-fiction texts (Q4).				
Identifying and analysing how writers present their viewpoints – analysing the methods they choose (Q4).				
Planning an extended piece of opinion writing (Q5 / Section B)				
Using a range of sophisticated vocabulary precisely in my opinion writing. (Q5 / Section B)				
Appealing to a specific audience in my opinion writing (Q5 / Section B).				
Using features of form thoughtfully (letter, article, speech, essay, leaflet) (Q5 / Section B).				
Using a range of persuasive methods in my opinion writing. (Q5 / Section B)				
Using a range of punctuation accurately in my opinion writing. (Q5 / Section B)				
Using a range of sentence structures and starters in my opinion writing. (Q5 / Section B)				
Proof-reading and editing my opinion writing. (Q5 / Section B)				

Personal Learning Checklists

Science – Inheritance

Key Ideas	S	O	R	T
Describe features of sexual and asexual reproduction				
Describe what happens during meiosis and compare to mitosis				
Describe what happens at fertilisation				
Bio ONLY: Explain advantages of sexual and asexual reproduction				
Bio ONLY: Describe examples of organisms that reproduce both sexually and asexually (malarial parasites, fungi, strawberry plants and daffodils)				
Describe the structure of DNA and its role in storing genetic information inside the cell				
Explain the term 'genome' and the importance of the human genome (specific examples from spec only)				
Bio ONLY: Describe the structure of DNA, including knowledge of nucleotide units				
Bio & HT ONLY: Explain complementary base pairing in DNA				
Bio & HT ONLY: Explain the relationship between DNA bases (ATCG), amino acids and proteins				
Bio & HT ONLY: Describe how proteins are synthesised on ribosomes, including protein folding and its importance for protein function				
Bio & HT ONLY: Explain what mutations are, and the possible effects of mutations				
Bio & HT ONLY: Explain what non-coding parts of DNA are, and why they are important				
Describe how characteristics are controlled by one or more genes, including examples				
Explain important genetic terms: gamete, chromosome, gene, allele, genotype, phenotype, dominant, recessive, homozygous and heterozygous				
Explain and use Punnet square diagrams, genetic crosses and family trees				
HT ONLY: Construct Punnet square diagrams to predict the outcomes of a monohybrid cross				

Science – Inheritance

Key Ideas	S	O	R	T
Describe cystic fibrosis and polydactyly as examples of inherited disorders				
Evaluate social, economic and ethical issues concerning embryo screening when given appropriate information				
Describe how the chromosomes are arranged in human body cells, including the function of the sex chromosomes				
Explain how sex is determined and carry out a genetic cross to show sex inheritance				
Describe what variation is and how it can be caused within a population				
Describe mutations and explain their influence on phenotype and changes in a species				
Explain the theory of evolution by natural selection				
Describe how new species can be formed				
Describe what selective breeding is				
Explain the process of selective breeding, including examples of desired characteristics and risks associated with selective breeding				
Describe what genetic engineering is, including examples, and how it is carried out				
Explain some benefits, risks and concerns related to genetic engineering				
HT ONLY: Explain the process of genetic engineering, to include knowledge of enzymes and vectors				
Bio ONLY: Describe different cloning techniques, to include: tissue culture, cuttings, embryo transplants and adult cell cloning				
Bio ONLY: Describe the ideas proposed by Darwin in his theory of natural selection and explain why this theory was only gradually accepted				
Bio ONLY: Describe other inheritance-based theories that existed (apart from the theory of natural selection), and the problems with these theories				
Bio ONLY: Describe the work of Alfred Russel Wallace				

Science – Inheritance

Key Ideas	S	O	R	T
Bio ONLY: Explain how new species can be formed				
Bio ONLY: Describe how our understanding of genetics has developed over time, to include knowledge of Mendel				
Describe some sources of evidence for evolution				
Describe what fossils are, how they are formed and what we can learn from them				
Explain why there are few traces of the early life forms, and the consequences of this in terms of our understanding of how life began				
Describe some of the causes of extinction				
Describe how antibiotic-resistant strains of bacteria can arise and spread (inc MRSA)				
Describe how the emergence of antibiotic- resistant bacteria can be reduced and controlled, to include the limitations of antibiotic development				
Describe how organisms are named and classified in the Linnaean system				
Explain how scientific advances have led to the proposal of new models of classification, inc three-domain system				
Describe and interpret evolutionary trees				

Personal Learning Checklists

Science – Ecology

Key Ideas	S	O	R	T
Describe levels of organisation in an ecosystem				
Describe the importance of interdependence and factors organism might compete for				
Explain how changes to abiotic factors can affect a community				
Explain how biotic factors can affect a community				
Explain how functional, structural and behavioral adaptations help organisms survive				
Describe food chains and food webs				
Use sampling techniques to estimate the size of a population				
Use sampling techniques to investigate the affect of abiotic factors on abundance of organisms				
Explain the importance of water recycling in an ecosystem				
Explain the importance of carbon cycling in an ecosystem				
Explain what biodiversity is and why it is important to maintain				
Describe how and why humans use land				

Science – Rates of Reaction

Key Ideas	S	O	R	T
Calculate the rate of a chemical reaction over time, using either the quantity of reactant used or the quantity of product formed, measured in g/s, cm3/s or mol/s				
Draw and interpret graphs showing the quantity of product formed or reactant used up against time and use the tangent to the graph as a measure of the rate of reaction				
Describe how different factors affect the rate of a chemical reaction, including the concentration, pressure, surface area, temperature and presence of catalysts				
Required practical 11: investigate how changes in concentration affect the rates of reactions by a method involving measuring the volume of a gas produced, change in colour or turbidity				
Use collision theory to explain changes in the rate of reaction				
Explain what a reversible reaction is, including how the direction can be changed and represent it using symbols: A + B ⇌ C + D				
Explain that, for reversible reactions, if a reaction is endothermic in one direction, it is exothermic in the other direction				
Describe the State of dynamic equilibrium of a reaction as the point when the forward and reverse reactions occur at exactly the same rate				
HT ONLY: Explain that the position of equilibrium depends on the conditions of the reaction and the equilibrium will change to counteract any changes to conditions				
HT ONLY: Explain and predict the effect of a change in concentration of reactants or products, temperature, or pressure of gases on the equilibrium position of a reaction				

Science – Organic Chemistry

Key Ideas	S	O	R	T
Explain how crude oil is formed and why it is a finite resource				
State the first 4 alkanes and explain their properties				
Explain how fractional distillation works				
Explain why fractional distillation is important				
Explain how the properties of hydrocarbons are linked to their structure				
Explain why cracking is important and how we test for alkenes				
Describe the two processes used to crack long chain alkanes				
Balance equations that show cracking				

Personal Learning Checklists

Science – Chemical analysis

Key Ideas	S	O	R	T
Define a pure substance and identify pure substances and mixtures from data about melting and boiling points				
Describe a formulation and identify formulations given appropriate information				
Describe chromatography, including the terms stationary phase and mobile phase and identify pure substances using paper chromatography				
Explain what the Rf value of a compound represents, how the Rf value differs in different solvents and interpret and determine Rf values from chromatograms				
Required practical 6: investigate how paper chromatography can be used to separate and tell the difference between coloured substances (inc calculation of Rf values)				
Explain how to test for the presence of hydrogen, oxygen, carbon dioxide and chlorine				
Chem ONLY: Identify some metal ions from the results of flame tests and describe how to conduct a flame test				
Chem ONLY: Describe how sodium hydroxide solution can be used to identify some metal ions and identify metal ions from the results of their reactions with sodium hydroxide solution				
Chem ONLY: Write balanced equations for the reactions between sodium hydroxide solution and some metal ions to produce insoluble hydroxides				
Chem ONLY: Describe how to identify carbonates using limewater				
Chem ONLY: Describe how to identify negative ions, including halide ions using silver nitrate and sulfate ions using barium chloride				
Required practical 7: use of chemical tests to identify the ions in unknown single ionic compounds				
Chem ONLY: State the advantages of using instrumental methods to identify elements and compounds compared to chemical tests				
Chem ONLY: Describe the process of and how to use flame emission spectroscopy to identify metal ions; interpret the results of a flame emission spectroscopy tests				
Using appropriate connectives				
Developing analysis with relevant contextual ideas				

Science – Chemistry of the atmosphere

Key Ideas	S	O	R	T
State the proportions of different gases in the atmosphere				
State the early composition of the atmosphere				
Describe and explain how the composition of the atmosphere has changed over time				
Explain why levels of oxygen increased				
Explain why levels of carbon dioxide have decreased				
State the 4 green house gases				
Explain why human activities have increased the level of greenhouse gases in the atmosphere				
Describe what the greenhouse effect is				
Explain what global climate change is and the impact of it				
Explain what a carbon footprint is and how we can reduce it				
Explain how carbon monoxide, particulates, sulphur dioxide and nitrous oxides are formed and how they contribute to air pollution				

Science – Using resources

Key Ideas	S	O	R	T
State how we can use Earth's resources				
State what sustainable development is and why it is important				
Describe the differences between finite and renewable resources				
State what potable water is				
Explain how we obtain potable water				
Analysis and purify samples of water from different sources				
Explain causes of wastewater and how to treat it				
Describe what phytomining and bioleaching are				
Describe and explain what a life cycle assessment is				
Explain how we can reduce the environmental impact of using resources				

Personal Learning Checklists

Science – Using Resources

Key Ideas	S	O	R	T
Chem ONLY: Define corrosion and describe rusting as an example of corrosion				
Chem ONLY: Describe ways to prevent corrosion, including providing coatings, sacrificial protection and explain how sacrificial protection works				
Chem ONLY: Describe the following alloys bronze, gold, steels and aluminium, their uses and describe the benefits of using alloys instead of pure metals				
Chem ONLY: Compare the properties of materials, including glass and clay ceramics, polymers and composites and explain how their properties are related to their uses				
Chem ONLY: Discuss the different types of polymers and how their composition affects their properties, including thermosoftening and thermosetting polymers				
Chem ONLY: Explain what composites are and provide examples of composites and their benefits over other types of materials				
Chem ONLY: Describe the Haber process, including the reactants and products, recycling of remaining hydrogen and nitrogen and the chemical equation				
Chem & HT ONLY: For the Haber process interpret graphs of reaction conditions versus rate				
Chem ONLY: Apply the principles of dynamic equilibrium to the Haber process and discuss the trade-off between the rate of production and the position of equilibrium				
Chem ONLY: Explain how the commercially used conditions for the Haber process are related to the availability and cost of raw materials and energy supplies				
Chem ONL: Recall the names of the salts produced when phosphate rock is treated with nitric acid, sulfuric acid and phosphoric acid				
Chem ONLY: Describe NPK fertilisers and the compounds they are composed of and compare the industrial production of fertilisers with the laboratory preparations				

Science – Waves

Key Ideas	S	O	R	T
Required practical activity 10: investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface.				
HT ONLY: Explain how radio waves can be produced by oscillations in electrical circuits, or absorbed by electrical circuits				
Explain that changes in atoms and the nuclei of atoms can result in electromagnetic waves being generated or absorbed over a wide frequency range				
State examples of the dangers of each group of electromagnetic radiation and discuss the effects of radiation as depending on the type of radiation and the size of the dose				
State examples of the uses of each group of electromagnetic radiation, explaining why each type of electromagnetic wave is suitable for its applications				
PHY ONLY: State that a lens forms an image by refracting light and that the distance from the lens to the principal focus is called the focal length				
PHY ONLY: Explain that images produced by a convex lens can be either real or virtual, but those produced by a concave lens are always virtual				
PHY ONLY: Construct ray diagrams for both convex and concave lenses				
PHY ONLY: Calculate magnification as a ratio with no units by applying, but not recalling, the formula: [magnification = image height / object height]				
PHY ONLY: Explain how the colour of an object is related to the differential absorption, transmission and reflection of different wavelengths of light by the object				
PHY ONLY: Describe the effect of viewing objects through filters or the effect on light of passing through filters and the difference between transparency and translucency				
PHY ONLY: Explain why an opaque object has a particular colour, with reference to the wavelengths emitted				
PHY ONLY: State that all bodies, no matter what temperature, emit and absorb infrared radiation and that the hotter the body, the more infrared radiation it radiates in a given time				

Science – Waves

Key Ideas	S	O	R	T
Required practical 9 (physics only): investigate the reflection of light by different types of surface and the refraction of light by different substances.				
PHY & HT ONLY: Describe, with examples, processes which convert wave disturbances between sound waves and vibrations in solids				
PHY & HT ONLY: Explain why such processes only work over a limited frequency range and the relevance of this to the range of human hearing, which is from 20 Hz to 20 kHz				
PHY & HT ONLY: Define ultrasound waves and explain how these are used to form images of internal structures in both medical and industrial imaging				
PHY & HT ONLY: Compare the two types of seismic wave produced by earthquakes with reference to the media they can travel in and the evidence they provide of the structure of the Earth				
PHY & HT ONLY: Describe how echo sounding using high frequency sound waves is used to detect objects in deep water and measure water depth				
Describe what electromagnetic waves are and explain how they are grouped				
List the groups of electromagnetic waves in order of wavelength				
Explain that because our eyes only detect a limited range of electromagnetic waves, they can only detect visible light				
HT ONLY: Explain how different wavelengths of electromagnetic radiation are reflected, refracted, absorbed or transmitted differently by different substances and types of surface				
Illustrate the refraction of a wave at the boundary between two different media by constructing ray diagrams				
HT ONLY: Describe what refraction is due to and illustrate this using wave front diagrams				

Personal Learning Checklists

Science – Waves

Key Ideas	S	O	R	T
Required practical activity 10: investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface.				
HT ONLY: Explain how radio waves can be produced by oscillations in electrical circuits, or absorbed by electrical circuits				
Explain that changes in atoms and the nuclei of atoms can result in electromagnetic waves being generated or absorbed over a wide frequency range				
State examples of the dangers of each group of electromagnetic radiation and discuss the effects of radiation as depending on the type of radiation and the size of the dose				
State examples of the uses of each group of electromagnetic radiation, explaining why each type of electromagnetic wave is suitable for its applications				
PHY ONLY: State that a lens forms an image by refracting light and that the distance from the lens to the principal focus is called the focal length				
PHY ONLY: Explain that images produced by a convex lens can be either real or virtual, but those produced by a concave lens are always virtual				
PHY ONLY: Construct ray diagrams for both convex and concave lenses				
PHY ONLY: Calculate magnification as a ratio with no units by applying, but not recalling, the formula: [magnification = image height / object height]				
PHY ONLY: Explain how the colour of an object is related to the differential absorption, transmission and reflection of different wavelengths of light by the object				
PHY ONLY: Describe the effect of viewing objects through filters or the effect on light of passing through filters and the difference between transparency and translucency				
PHY ONLY: Explain why an opaque object has a particular colour, with reference to the wavelengths emitted				
PHY ONLY: State that all bodies, no matter what temperature, emit and absorb infrared radiation and that the hotter the body, the more infrared radiation it radiates in a given time				

Science – Magnetism

Key Ideas	S	O	R	T
Describe the attraction and repulsion between unlike and like poles of permanent magnets and explain the difference between permanent and induced magnets				
Draw the magnetic field pattern of a bar magnet, showing how field strength and direction are indicated and change from one point to another				
Explain how the behaviour of a magnetic compass is related to evidence that the core of the Earth must be magnetic				
Describe how to plot the magnetic field pattern of a magnet using a compass				
State examples of how the magnetic effect of a current can be demonstrated and explain how a solenoid arrangement can increase the magnetic effect of the current				
Draw the magnetic field pattern for a straight wire carrying a current and for a solenoid (showing the direction of the field)				
PHY ONLY: Interpret diagrams ofelectromagnetic devices in order to explain how they work				
HT ONLY: State and use Fleming's left-hand rule and explain what the size of the induced force depends on				
HT ONLY: Calculate the force on a conductor carrying a current at right angles to a magnetic field by applying, but not recalling, the equation: [F = BIL]				
HT ONLY: Explain how rotation is caused in an electric motor				
PHY & HT ONLY: Explain how a moving-coil loudspeaker and headphones work				
PHY & HT ONLY: Describe the principles of the generator effect, including the direction of induced current, effects of Lenz' Law and factors that increase induced p.d.				
PHY & HT ONLY: Explain how the generator effect is used in an alternator to generate a.c. and in a dynamo to generate d.c.				

Science – Magnetism

Key Ideas	S	O	R	T
PHY & HT ONLY: Draw/interpret graphs of potential difference generated in the coil against time				
PHY & HT ONLY: Explain how a moving-coil microphone works				
PHY & HT ONLY: Explain how the effect of an alternating current in one coil inducing a current in another is used in transformers				
PHY & HT ONLY: Explain how the ratio of the potential differences across the two coils depends on the ratio of the number of turns on each				
PHY & HT ONLY: Apply the equation linking the p.d.s and number of turns in the two coils of a transformer to the currents and the power transfer				
PHY & HT ONLY: Apply but not recalling the equations: [$V_s \times I_s = V_p \times I_p$] and [$v_p / v_s = n_p / n_s$] for transformers				

Science – Waves

Key Ideas	S	O	R	T
PHY ONLY: Describe a perfect black body as an object that absorbs all the radiation incident on it and explain why it is the best possible emitter				
PHY ONLY: Explain why when the temperature is increased, the intensity of every wavelength of radiation emitted increases, but the intensity of the shorter wavelengths increases more rapidly				
PHY & HT ONLY: Explain and apply the idea that the temperature of a body is related to the balance between incoming radiation absorbed and radiation emitted				
PHY & HT ONLY: Describe how the temperature of the Earth as dependent on the rates of absorption and emission of radiation and draw and interpret diagrams that show this				

Personal Learning Checklists

Creative media

Key Ideas	S	O	R	T
What are the different types of creative media products?				
How can you identify the audience for a media product?				
What are the purposes of different media products?				
What is meant by codes and conventions?				
How are media products designed to appeal to the audiences?				
Representation of people and places				
Audience interpretation				
Narrative : What are the different ways that media producers develop a story?				
Media production techniques				

Computer Science

Key Ideas	S	O	R	T
I know how to open, close, append and create files in Python				
I can explain and identify Syntax and Logic errors in code				
I know the different types of test data, how to design a test and how to record output in a test table.				
Know the difference between Iterative and terminal testing				
I can demonstrate the different Search algorithms and can choose for a task				
I can demonstrate the different Sort algorithms and can choose for a task				
I can perform SQL queries on tables of data				
I can write code which uses selection				
I can write code which uses iteration				
I can implement subroutines and know the benefits of using them				
I can discuss the Cultural, Legal, Environmental and Ethical issues in technology development				
I can create and use 1D and 2D Arrays for problem solving				
I can identify methods to make code more maintainable				

Design Technology

Key Ideas	S	O	R	T
I am able to use ACCESSFM to identify the key characteristics of products.				
I can model and develop an idea based on a conceptual challenge.				
I can use my knowledge of existing products and client needs to devise creative solutions to a problem.				
I know a range of material properties and can select appropriate materials to manufacture products.				
I know common stock forms that materials are supplied in and can describe a range of processes such as turning metals, die-cutting paper and card and extrusion of polymers.				
I can calculate the area and volume of shapes and use this to work out material costs and wastage when making products.				
I can use ideas on sustainability when analysing and designing products.				
I can evaluate manufacturing techniques such as JIT and Lean Manufacturing.				
I can compare technology push and market pull.				
I can describe what Fair Trade means and why designers should choose to use these resources.				
I can understand and use standard drawing conventions to interpret and communicate designs.				

Personal Learning Checklists

Geography

Key Ideas	S	O	R	T
Define development				
Name economic development indicators				
Explain the benefits of socio-economic indicators, e.g.; HDI				
Explain the stages in the demographic transition model				
Locate and describe the tropical rainforest biome				
Describe and evaluate strategies to reduce the development gap				
Describe the location of Nigeria in Africa				
Explain the reasons for rapid economic growth				
Explain the advantages and disadvantages of TNCs in Nigeria				
Explain the environmental consequences of rapid industrialisation in Nigeria				

Geography

Key Ideas	S	O	R	T
Define key terms				
Describe the causes of economic change				
Define post-industrial				
Explain the effects of post-industrial change in the UK				
Explain the reasons for the development of the quaternary sector in the UK				
Describe the differences between a business and science park				
Explain the impacts of rural depopulation				
Explain the impacts of rural population growth				
Explain transport developments in the UK				
Evaluate strategies to reduce the north-south divide				

Geography

Key Ideas	S	O	R	T
Describe the characteristics of upland and lowland areas				
Explain the similarities and differences between constructive and destructive waves				
Explain how waves break				
Explain the process of mass movement and weathering				
Explain the 4 processes of erosion				
Explain the formation of a bay and headland				
Explain the formation of a coastal stack				
Explain the process of longshore drift				
Explain the formation of a spit				
Assess the advantages and disadvantages of coastal management techniques				
Explain the impacts of coastal management upon the Holderness coast				

Personal Learning Checklists

Health and social care

Key Ideas	S	O	R	T
What is PIES?				
Explain Physical Factors (inherited conditions, mental ill health, physical abilities, sensory impairments, physical ill health)				
What are the two economic factors? (employment and financial)				
What are the two social factors? (bullying, discrimination)				
Explain Lifestyle Factors (nutrition, physical activity, alcohol, smoking, illegal drugs)				
Explain Environmental Factors (housing, home environment, air pollution, water pollution)				
Explain Cultural Factors (religion, community, gender roles, gender identity, sexual orientation)				

History

Key Ideas	S	O	R	T
I can state Medieval treatments, preventions and beliefs about the cause of disease and illness				
I can explain the outbreak of the Black Death in 1348				
I can state Early Modern (renaissance) treatments, preventions and beliefs about the cause of disease and illness				
I can explain the changes and continuities in the Early Modern (renaissance) period				
I can state 18th and 19th century treatments, preventions and beliefs about the cause of disease and illness				
I can explain the changes and continuities in the 18th and 19th century period				
I can state Modern treatments, preventions and beliefs about the cause of disease and illness				
I can explain the changes and continuities in the modern period				
I can state what it was like to fight in the trenches and the medical issues associated with this				
I know how to analyse source content and provenance				

Hospitality and Catering

Key Ideas	S	O	R	T
What does the hospitality and catering industry cover?				
Explain job requirements, working conditions and qualification in the industry				
What are the factors affecting the success of businesses within the industry?				
How are kitchens hygienic, safe and efficient?				
What does ‘front of house’ mean?				
Explain what a customer’s requirements are.				
What are the 5 main Health and Safety acts?				
Understand the signs, symptoms and laws for food related ill health				

Personal Learning Checklists

Music

Key Ideas	S	O	R	T
I understand the compositional features of several genres of music that we have studied.				
I understand the sonic features of several genres of music that we have studied.				
I am able to create a performance in a number of genres that we have studied.				
I am able to use my knowledge of the features of these genres to compose a piece of music in this genre.				
I am able to figure out chords from a chord lead sheet.				
I understands all aspects of MADTSHIRTS and can use my knowledge of the musical elements to analyse music.				

Religious Studies

Key Ideas	S	O	R	T
I can explain the meaning and significance of peace, justice, forgiveness and reconciliation.				
I can outline religious attitudes towards violence, violent protest and terrorism.				
I can explain the reasons for war.				
I can outline the just war theory.				
I can explain the criteria for a Holy war.				
I can explain religious beliefs about pacifism.				
I can evaluate whether religion is a cause of war and violence in today's world.				
I can explain religious attitudes towards nuclear weapons and weapons of mass destruction.				
I can explain how religions work for peace and help victims of war.				
I can define all the key words from this unit.				

Religious Studies

Key Ideas	S	O	R	T
I can outline beliefs about good and evil.				
I can explain why people commit crime and the religious attitudes about how they should be treated.				
I can outline religious attitudes towards hate crimes, theft and murder.				
I can explain the aims of punishment, including retribution, deterrence and reformation.				
I can explain religious beliefs about how criminals should be treated, including prison, corporal punishment and community service.				
I can outline religious teachings about forgiveness.				
I can explain religious attitudes towards the death penalty.				
I can outline ethical arguments for and against the death penalty.				
I can define all the key words from this unit.				

Personal Learning Checklists

Performing arts

Key Ideas	S	O	R	T
I can organise my toolkit of devising skills to come up with ideas.				
I understand different dramatic techniques such as 'split stage', 'flashback', 'breaking the 4th wall'.				
I am confident in how to use physical skills to enhance a piece of theatre.				
I am confident in how to use vocal skills to enhance a piece of theatre.				
I am able to create a piece of theatre from a stimulus.				
I understand how to evaluate a piece of theatre effectively, taking into consideration, the structure, the skills and the techniques.				

PSHE

Key Ideas	S	O	R	T
I can identify when consent has been given in a variety of scenarios				
I can outline ways in which you could seek consent within a relationship				
I can explain the facts and laws regarding abortion				
I could give reasons for and against people wanting to have an abortion				
I could describe characteristics of a healthy relationship				
I could describe the characteristics of an unhealthy relationship				
I could give strategies that would help deal with unhealthy relationships				

Spanish

Key Ideas	S	O	R	T
I know my non-negotiable verbs for the past, present and future tenses				
I know at least 5 interesting adjectives that I can apply to my work				
In the writing exam, I understand the format that each of the tasks takes				
I can write the success criteria for these tasks from memory				
In the Speaking exam, I understand the format of each of the three tasks				
I feel confident with the key vocab for the role-play				
I regularly learn the key vocab for the reading and listening exams				

Sport

Key Ideas	S	O	R	T
Components of Physical Fitness				
Components of Skill Related Fitness				
The Principle of FITT				
Principles of Training				
Additional Principles of Training				
Exercise Intensity – Borg Scale				
Exercise Intensity – Training Thresholds				
Reasons for Fitness Testing				
Factors Affecting Reliability of Fitness Testing				
Pre – Test Procedures				

English - 'An Inspector Calls' by J.B. Priestley

1. Plot

1a. ACT ONE

1. The Birling family live in a 'fairly large suburban house' and, at rise of curtain, they are 'pleased with themselves'.
2. Birling remarks awkwardly that 'it's a pity Sir George and – er – Lady Croft can't be with us'.
3. Gerald presents Sheila with an engagement ring and she exclaims, 'Oh – it's wonderful!'
4. Birling makes predictions about the future; he says, 'we're in for a time of steadily increasing prosperity'.
5. Birling is unrepentant about his role in the suicide of Eva Smith, remarking that 'it's a free country'.
6. Eric disagrees by saying that 'it isn't if you can't go and work somewhere else'.
7. Eva does manage to find another job because 'Milwards suddenly found themselves short-handed'.
8. Sheila feels deeply guilty about using her influence to get Eva sacked; she says that 'if I could help her now, I would –'.
9. The Inspector reveals that Eva changed her name to Daisy Renton, which prompts Gerald to ask '[*startled*] what?'
10. Gerald asks Sheila not to tell the Inspector about his relationship with Daisy; he says, 'we can keep it from him'.

1b. ACT TWO

1. Gerald tries to deter Sheila from staying to witness the questions and answers that are 'bound to be unpleasant'.
2. Mrs Birling notes Eric's absence and remarks that he 'seems to be in an excitable silly mood'.
3. Gerald concedes to the Inspector that he met the 'quite different' and 'young and pretty' Daisy in the disreputable Palace Bar.
4. Gerald says that he 'broke it off' with her before he went away for 'several weeks' on business.
5. The Inspector reveals that Daisy kept a diary, in which she wrote that 'she felt there'd never be anything as good again for her'.
6. Obviously upset, Gerald excuses himself and leaves; however, he says, 'I'm coming back'.
7. Mrs Birling claims that she 'did nothing I'm ashamed of or that won't bear investigation'.
8. She refused Eva charity money, stating that it is the father's 'responsibility' to support her.
9. Mrs Birling defiantly says, 'I blame the young man who was the father of the child she was going to have'.
10. When it is implied that Eric is the father, Mrs Birling becomes agitated and says, 'I *won't* believe it'.

1c. ACT THREE

1. Eric says bitterly to his mother that 'you haven't made it any easier for me'.
2. Eric admits that he was 'a bit squiffy' when he met Eva and 'was in that state when a chap easily turns nasty'.
3. He saw Eva again; he 'liked' her, but 'wasn't in love with her or anything'.
4. Eric tells the Inspector that Eva 'didn't want me to marry her'.
5. Eric admits to taking money from his father; Birling reacts angrily and says that Eric has been 'spoilt'.
6. As the Inspector prepares to leave, he highlights to the Birlings and Gerald that each of them 'helped to kill' Eva.
7. He asks them to remember that 'there are millions and millions and millions of Eva Smiths and John Smiths still left with us'.
8. The Inspector leaves and Birling says that he is 'absolutely ashamed' of Eric; Eric says that he is 'ashamed' of his father 'as well'.
9. Birling believes that he and the rest of the family were 'bluffed'; he later confidently concludes that the Inspector was a 'fake!'
10. The play ends with Birling reporting that 'a police inspector is on his way here – to ask some – questions'.

2. Characters

2a. Inspector Goole

- ✓ Priestley's mouthpiece
- ✓ Commanding
- ✓ Persuasive
- ✓ Didactic
- ✓ Social justice and reform
- ✓ Socialist
- ✓ Omnipotent

2b. Mr Arthur Birling

- ✓ Capitalist
- ✓ Arrogant
- ✓ Verbose
- ✓ Stubborn
- ✓ Ignorant
- ✓ Industrialist

2c. Mrs Sybil Birling

- ✓ Judgmental
- ✓ Old money
- ✓ Condescending
- ✓ Traditional, etiquette
- ✓ Insincere
- ✓ Controlling

2d. Sheila Birling

- ✓ Astute
- ✓ Materialistic
- ✓ Emotional
- ✓ Compassionate
- ✓ Transformed
- ✓ Empowered

2e. Eric Birling

- ✓ Irresponsible
- ✓ Spoilt
- ✓ Product of his environment
- ✓ Reckless
- ✓ Immature
- ✓ Transformative

2f. Gerald Croft

- ✓ Aristocratic
- ✓ Secretive
- ✓ Duplicitous
- ✓ Privileged
- ✓ Evasive
- ✓ Emotional

2g. Eva Smith / Daisy Renton

- ✓ Working class
- ✓ Determined
- ✓ Oppressed and mistreated
- ✓ Vulnerable
- ✓ Allegorical
- ✓ Emblematic

English - 'An Inspector Calls' by J.B. Priestley

3. Context

3a. J.B. Priestley Priestley was born into a working class family who lived in Bradford, Yorkshire. It was here that he noticed that many people lived in poverty and the city's 'respectable' folk could be smug, even hypocritical. He fought for England in WWI and witnessed the social inequalities present amongst the commanding officers and the lower ranking soldiers. Priestley held a strong socialist political view and was part of a group that set up the socialist Common Wealth Party in 1942. During WWI he delivered his 'Postscripts' radio broadcasts, calling for a better, fairer society after the war was over.

3b. Women in Edwardian and post-war England At the start of the C20th, women had very conventional roles in society. The Edwardian period was a patriarchal one. If married, women usually stayed at home to look after children while their husband worked. If single, they did work which usually involved some form of service. During the world wars, women were required to work, as men were called up to fight. Women were praised for their wartime work but expected to make way for the returning troops; there was an assumption that their temporary roles had been specifically linked to wartime. By 1951 the number of working women had returned almost to the pre-war level and a bar on married women working continued in many jobs.

3c. Edwardian society and social norms There was a big divide between the rich and the poor, unwritten rules maintaining the status quo. The rich often perceived poor people to have no manners or sophistication, and there was a very low level of social mobility (very few working class people would be able to become middle class).

3d. The Great Unrest Between 1911 and 1914, Britain and Ireland were rocked by a series of mass strikes of miners, railway, dock, and tramway workers, as well as those from other industries that went on solidarity strikes.

3e. Post-war Britain Following the end of WWII, the majority of the British people, did not want a return to pre-war Conservative policies, which they blamed for the hardship of the 1930s, and there was a mood for social reform. At the 1945 general election, Winston Churchill was defeated by the Labour Party headed by Clement Attlee. A welfare state (a society in which the government provides services like healthcare, financial help for those who need it) was established and in 1948 the NHS founded.

4. Authorial Intent

J.B. Priestley wrote this didactic play for a number of reasons...

4a - To encourage... his audience to considers its own attitude towards the working and middle classes, entrepreneurs and gender issues.

4b – To expose... the hypocrisy and double standards of certain strands of Edwardian society.

4c – To refute... Capitalist ideologies and highlight the exploitative nature of Capitalist societies.

4d – To warn... of the terrifying consequences of forsaking social responsibility and neglecting the needs of those who are less fortunate

4e - The text is relevant today as... social inequality, prejudice and injustice still affect many people in modern Britain, as evidenced by the cost-of-living crisis and the rising number of people accessing food banks.

5. Vocabulary

5a = ostentatious (adj) Characterized by pretentious or showy display
5b = condescending (adj) Having or demonstrating an attitude of patronizing superiority
5c = patriarchy (noun) A system of society in which men hold the power and women are largely excluded from it.
5d = privileged (adj) Granted a special right, advantage, or immunity available only to a particular person or group
5e = culpable (adj) Deserving of blame
5f = avarice (noun) Extreme greed
5g = disparage (verb) To speak down to another in an insulting and rude manner
5h = infantile (adj) Acting like or likened to a young child
5i = objectify (verb) To degrade something or someone to the status of a mere object
5j = didactic (adjective) Intended to teach, or to improve morals by teaching
5k = remorseful (adjective) Full of regret for something they have done; sorry for past actions
5l = ignorant (noun) Lacking knowledge or awareness of something.
5m = oppressed (adjective) treated in an unfair or cruel way, preventing someone from having opportunities and freedom
5n = unashamedly (adverb) Openly, without guilt or embarrassment
5o = Socialism (noun) The belief that ways of making money and wealth should be shared more equally in society.
5p = Capitalism (noun) The belief that ways of making money and wealth should in control of individuals and people should be able to control how much profit they earn.
5q = plight (noun) A difficult or unfortunate position; struggle.

English - 'An Inspector Calls' by J.B. Priestley

6. Subject Vocabulary

6a = play (noun) In literature, a dramatic work designed to be performed on stage.

6b = allegory A story that can be interpreted to reveal a hidden meaning, typically a moral or political one

6c = morality play (noun phrase) An allegorical drama popular in Europe especially during the C15th and C16th, in which the characters personify moral qualities (such as charity or greed).

6d = act (noun) A section of a play.

6e= stage direction (noun phrase) An instruction in the text of a play how an actor moves or speaker, or the sound effects, props and lighting.

6f = prop (noun) An object used on the set of a play.

6g =polemic (noun) a piece of writing expressing a strongly critical attack someone or something.

6h = dramatic irony (noun phrase) A point in a play at which the audience of a play knows something that the characters do not know.

6i = context (noun) The circumstances surrounding writing; social issues, historical events, author's background and beliefs, and how they influence a writer's choices

6j = characterisation (noun) A method used by writers to create and craft characters.

6k = foil (noun) A character who contrasts with another

6l = symbol (noun) A character, idea, image or setting that represents a bigger idea

6m = imagery (noun) The use of language to create vivid pictures in the readers' minds

6n = metaphor (noun) Comparing one thing to another directly – as if one thing is another – to highlight their similarities.

6o = simile (noun) Comparing one thing to another using the words 'like' or 'as', to highlight their similarities.

6p = irony (noun) A situation in which something which was intended to have a particular result has the opposite or a very different result.

7. Themes

7a. Wealth, power and influence

The Birlings are a family of wealth and power, who take pride in their high social position. Mr Birling is a successful businessman, and the family inhabits a nice home with a maid (and likely other servants). The play begins with the family celebrating and feeling generally pleased with themselves and their fortunate circumstance. Throughout the Inspector's investigation, however, it comes out that several of the Birlings have used their power and influence immorally, in disempowering and worsening the position of a girl from a lower class: Mr. Birling used his high professional position to force Eva Smith out of his factory when she led a faction of workers in demanding a raise; Sheila, in a bad temper, used her social status and her family's reputation to have the girl fired from Milward's; Mrs. Birling used her influence in the Women's Charity Organisation to deny the girl monetary aid. Both Sheila and Mrs. Birling acted upon petty motivations in injuring the girl; Mr. Birling acted upon selfish, capitalist motivations.

7b. Blame and Responsibility

The question asked throughout the play is: who is responsible for the suicide of Eva Smith? Who is to blame? The arc of the play follows the gradual spreading of responsibility, from Mr. Birling, to Mr. Birling and Sheila, to Mr. Birling and Sheila and Gerald, and so on and so forth. Each of the characters has different opinions about which of them is most responsible for the girl's suicide. Mrs. Birling, most extremely, ends up blaming her own son, by suggesting that the person most responsible is the man that impregnated the girl, before realizing that the person in question is Eric.

In the end, the Inspector universalises the shared responsibility that the Birlings feel for the girl's death, into a plea for Socialism: "We are members of one body. We are responsible for each other. And I tell you that the time will soon come when if men will not learn that lesson, then they will be taught it in fire and blood and anguish." The lesson of the Inspector, and of the play at large, is that our actions have an influence beyond themselves and therefore that we are already responsible for each other so long as we are responsible for ourselves and our own actions.

7c. Class Politics

Mr. Birling describes the politics of the day as revolving around "Capital versus Labor agitations." Mr. Birling is a representative Capitalist, who cares only about his company's profit. He speaks of himself as "a hard-headed, practical man of business," and looks forward to the prospect of being knighted. The girls who lead a worker's strike in his factor, meanwhile, represent the Labor side of the conflict in trying to improve the rights and wages of laborers and the lower classes.

The Inspector speaks the voice of Socialism, of the Labour side of the conflict; he seeks to make the Birlings realise the implicit corruption of Capitalism by emphasizing how easy it was for them to cause pain for the lower class without even realizing at the time the significance of their own actions.

7d. Age

Age is an important theme in 'An Inspector Calls'. Priestley uses it to show how he believed that there was hope in the younger generation's ability to learn and change.

The older characters' opinions and behaviours are stubbornly fixed. Mr Birling refuses to learn and Mrs Birling cannot see the obvious about herself and her children. Eric and Sheila however are younger - they accept their mistakes and offer the chance for a brighter future.

7e. Gender

'An Inspector Calls' was written after World War Two. As many British men went away to fight during the war, their positions in work had to be filled by women. This helped change existing perceptions. Men had to acknowledge the fact that women were just as capable as them. As a result of this, many women enjoyed a newfound freedom that working and earning money allowed them.

Not all men saw this change in attitude as a good thing and stayed stuck in the past. Priestley explores the impact of these new gender roles through the independence of Eva Smith and the sexist attitudes of Mr. Birling and Alderman Meggarty.

English - 'An Inspector Calls' by J.B. Priestley

8. Key Quotations and Methods

8a. "The lighting should be pink and intimate until the INSPECTOR arrives, and then it should be brighter and harder." Stage directions, contrast – the Inspector will bring about change in the family, altering some of the characters' world view by removing their 'rose-tinted spectacles' and expose their flaws.

8b. "When you're married you'll realise that men with important work to do sometimes have to spend nearly all their time and energy on their business." Mrs Birling Patronising tone imparts patriarchal values maintained by Mrs Birling's traditional values.

8c. "Lower costs and higher prices." Mr Birling contrast highlights Mr Birling's capitalist ideology, increasing his own profit and wealth.

8d. "The Titanic... unsinkable, absolutely unsinkable." Mr Birling Dramatic irony – Mr Birling presented as ignorant, foolish and untrustworthy from the outset.

8e. "As if we were all mixed up together like bees in a hive – community and all that nonsense." Simile and contemptuous tone – derides socialist values, collective responsibility.

8f. "This girl. Eva Smith, was one of them, she'd had a lot to say – far too much – so she had to go." Mr Birling Repeated pronoun 'she' and blunt tone; Mr Birling aware of his power and control as employer. Lack of workers' rights. Gender – females oppressed in patriarchal Edwardian England.

8g. "But these girls aren't cheap labour – they're people." Sheila Transforming attitudes, taking on board socialist ideology.

8h. "You used the power you had, as a daughter of a good customer and also of a man well known in the town, to punish the girl?" Inspector Goole Question highlights Sheila's selfishness and ignorance, but also as a product of her upbringing. Forces her to question her immoral actions. Verb 'punish' – power imbalance.

8i. "I know I'm to blame – and I'm desperately sorry." Adverb 'desperately', Sheila as emotional and remorseful.

8j. "I don't suppose for a moment that we can understand why the girl committed suicide. Girls of that class." Mrs Birling Supercilious tone – creates a divide between her affluent upper-middle class family and the working class.

8k. ""I insisted on Daisy moving into those rooms and I made her take some money." Gerald Verbs suggest Gerald took control of the situation, perhaps taking advantage of a vulnerable girl.

8l. "(massively) Public men, Mr Birling, have responsibilities as well as privileges." Inspector Goole Stage direction highlights importance of this message. Abstract noun 'responsibilities' conveys Priestley's socialist message – compassion and care for those less fortunate.

8m. "You slammed the door in her face." Inspector Goole Metaphor highlights how cruel and uncompromising Mrs Birling's treatment of Eva Smith was.

8n. "" She was here alone, friendless, almost penniless, desperate. She needed not only money but advice, sympathy, friendliness." List of emotive adjectives augments Eva's plight.

8o. "I was in that state when a chap easily turns nasty – and I threatened to make a row." Eric Connotations of violence. Affluent male abusing their power.

8p. "One Eva Smith has gone – but there are millions and millions and millions of Eva Smiths and John Smiths still left with us." Inspector Goole Repetition highlights the sheer number of struggling working class people. Eva Smith and John Smith symbols of the poorest and most vulnerable in society.

8q. "We don't live alone. We are members of one body. We are responsible for each other." Metaphor captures Priestley's socialist message.

8r. "(triumphantly)" Mr Birling." Stage direction and adverb. Mr Birling believes – ironically – that he has been victorious over the Inspector.

8s. "(tensely) I want to get out of this. It frightens me the way you talk." Stage direction and troubled tone, reveals how much Sheila has changed. Divide in the family.

8t. "(The telephone rings sharply)" Stage direction and adverb – jolts the Birlings back to reality. Circular structure – no escape from punishment. Ouspensky's theory of time.

English - GCSE Anthology Power and Conflict War Poems

1. Ozymandias by Percy Bysshe Shelley

1a. Content and Meaning

- The narrator meets a traveller who tells him about a decayed stature that he saw in a desert.
- The statue was of a long forgotten ancient King: the arrogant pharaoh Ozymandias.
- The statue now lies crumbled in the sand; the most powerful human creations cannot resist the power of nature.

1b. Context and Purpose

- Shelley was a poet of the 'Romantic period' (late 1700s and early 1800s).
- Romantic poets were interested in emotion and the power of nature.
- Shelley also disliked the concept of a monarchy and the oppression of ordinary people.
- The poem is ironic and one big metaphor: human power is only temporary.

1c. Language

- 'Sneer of cold command': plosive alliteration - the king was arrogant, this has been recognised by the sculptor, the traveller and the narrator.
- 'Look on my works, ye Mighty, and despair.': 'Look' = imperative, stressed syllable highlights commanding tone; ironic – he's telling others to admire the size of his statue and feel fear.
- 'The lone and level sands stretch far away.': the desert is vast, limitless, and its power is eternal.

1d. Structure and Form

- A sonnet (14 lines) but with an unconventional structure. A turning point (a volta) at line 9 (..these words appear), reflecting how human structures can be destroyed or decay.
- The iambic pentameter is also disrupted.
- First eight lines (the octave) of the sonnet: the statue is described in parts to show its destruction.
- Final two lines: the huge and immortal desert is described to emphasise insignificance of human power.

1e. Key Quotations

- 'Sneer of cold command'
- '"Look on my works, ye Mighty, and despair!"' 'Nothing beside remains'
- 'Boundless and bare, The lone and level sands stretch far away '

2. London by William Blake

2a. Content and Meaning

- The narrator is describing a walk around London and how he is saddened by the sights and sounds of poverty.
- The poem also addresses the loss of innocence and the determinism of inequality: how new-born infants are born into poverty.

2b. Context and Purpose

- Published in 1794, at a time of great poverty in many parts of London.
- Blake believed in social and racial equality.
- This poem is part of the 'Songs of Experience' collection, which focuses on how innocence is lost, and society is corrupt.
- The poem uses rhetoric (persuasion) to convince the reader that the people in power (landowners, Church, Government) are to blame for inequality.

2c. Language

- Sensory language creates an immersive effect: visual imagery ('Marks of weakness, marks of woe') and aural imagery ''cry of every man'
- Metaphor 'mind-forged manacles': they are trapped in poverty.
- Rhetorical devices to persuade: repetition ('In every..'); emotive language ('infant's cry of fear').
- Oxymorons criticise those in power – 'chartered Thames' - everything is owned by the rich; 'Every black'ning church appals' - the church is corrupt.

2d. Structure and Form

- A dramatic monologue; a first- person narrator who speaks passionately about what he sees.
- ABAB rhyme scheme: reflects the unrelenting misery of the city, and perhaps the rhythm of his feet as he trudges around the city.
- First two stanzas focus on people; third stanza focuses on the institutions he holds responsible; fourth stanza returns to the people – they are the central focus.

2e. Key Quotations

- 'In every cry of every man, / In every infant's cry of fear.'
- 'Mind-forged manacles'
- 'Every black'ning church appalls'

3. Extract from The Prelude by William Wordsworth

3a. Content and Meaning

- The story of a night-time adventure in a rowing boat that instils a deep and fearful respect for power of nature.
- At first, the speaker is calm and confident, but the sight of a huge mountain that comes into view scares the boy and he flees. He is in awe of the mountain and fearful of the power of nature.

3b. Context and Purpose

- We should respect nature and not take it for granted.
- Published shortly after his death, The Prelude was an epic poem that told the story of Wordsworth's life.
- Like Percy Shelley, Wordsworth was a Romantic poet and his poetry explores themes of nature, human emotion and how humans are shaped by their interaction with nature.

3c. Language

- 'One summer evening (led by her)': 'her' might be nature personified – this shows his love for nature but nature in control.
- 'Troubled pleasure': confident, but oxymoron suggests he knows it's wrong; forebodes troubling events that follow.
- 'A huge peak, black and huge': the repetition and the unsettling image of the mountain is shocking (contrasts the earlier tranquility).
- 'Upreared its head' and 'measured motion like a living thing': mountain is personified as a powerful beast, but calm – contrasts with his own panic.

3d. Structure and Form

- First person narrative – creates a sense that it is a personal poem.
- The regular rhythm and enjambment add to the effect of natural speech and a personal voice.
- The extract can be split into three sections, each with a different tone to reflect his shifting mood: Lines 1-20: (rowing) carefree and confident; lines 21-31: (the mountain appears) dark and fearful; lines 32-44: (following days) reflective and troubled.

3e. Key Quotations

- 'A huge peak, black and huge':
- 'With... measured motion like a living thing, strode after me.'
- 'Huge and mighty forms... were a trouble to my dreams.'

English - GCSE Anthology Power and Conflict War Poems

4. My Last Duchess by Robert Browning

4a. Content and Meaning

- The Duke is showing a visitor around his large art collection and proudly points out a portrait of his last wife, who is now dead. He reveals that he was annoyed by her over-friendly and flirtatious behaviour.
- He can finally control her by objectifying her and showing her portrait to visitors when he chooses.
- He is now alone as a result of his need for control.
- The visitor has come to arrange the Duke's next marriage, and the Duke's story is a subtle warning about how he expects his next wife to behave.

4b. Context and Purpose

- Browning may have been inspired by the story of an Italian Duke (Duke of Ferrara); his wife died in suspicious circumstances and it was rumoured that she had been poisoned.
- The poem explores the themes of power, control and jealousy. The Duke is used as a vehicle to convey ideas about the possessive and domineering nature of human beings and how damaging this can be.

4c. Language

- First person pronouns allude to possession and control of the duchess: 'That's my last Duchess painted on the wall', 'since none puts by the curtain I have drawn for you, but I.'
- Indignant tone - 'as if she ranked / My gift of a nine-hundred- years old name / With anybody's gift': she was beneath him in status, and yet dared to rebel against his authority.
- Scathing verb 'disgusts' reveals the Duke's hatred for her.
- 'I gave commands; Then all smiles stopped together': euphemism for his wife's murder.

4d. Structure and Form

- Dramatic monologue, in iambic pentameter. It is a speech, pretending to be a conversation – he doesn't allow the other person to speak!
- Enjambment: rambling tone, he's getting carried away with his anger and losing control of his emotions.
- Heavy use of caesura (commas and dashes): stuttering effect shows his frustration and anger: 'She thanked men, – good! but thanked / Somehow – I know not how'.
- Ending – switches to the statue of 'Neptune… taming a sea-horse' – reflects how quickly he moves on from the Duchess but continues the idea of power and authority (Neptune the Roman god of the sea).

4e. Key Quotations

- 'Since none puts by the curtain I have drawn for you, but I.'
- 'I gave commands; Then all smiles stopped together.'
- 'Notice Neptune though, taming a sea-horse'.

5. The Charge of the Light Brigade by Alfred Lord Tennyson

5a. Content and Meaning

- Describes a cavalry charge against Russians who shoot at the lightly- armed British with cannon from three sides of a long valley.
- Of the 600 hundred who started the charge, over half were killed, injured or taken prisoner.

5b. Context and Purpose

- Published six weeks after a disastrous battle against the Russians in the (unpopular) Crimean War
- A celebration of the men's courage and devotion to their country, symbols of the might of the British Empire; as Poet Laureate, he had a responsibility to inspire the nation and portray the war in a positive light (propaganda).

5c. Language

- "Into the valley of Death": this Biblical image portrays war as a supremely powerful, or even spiritual, experience.
- "jaws of Death" and "mouth of Hell": presents war as an animal that consumes its victims.
- "Honour the Light Brigade/Noble six hundred": imperative and language glorifies the soldiers, even in death. The 'six hundred' become a celebrated and prestigious group.
- "Shot and shell": sibilance creates whooshing sounds of battle.

5d. Structure and Form

- A ballad, a form of poetry to remember historical events.
- 6 stanzas, each representing 100 men who took part.
- Dactylic dimeter (HALF-a league / DUM- de-de) mirrors the sound of horses galloping and increases the poem's pace.
- Repetition of 'the six hundred' at the end of each stanza (epistrophe) emphasises huge loss.

5e. Key Quotations

- 'Half a league, half a league, / Half a league onward.'
- 'Jaws of Death… mouth of Hell'
- 'Honour the Light Brigade, / Noble six hundred!'

6. Exposure by Wilfred Owen

6a. Content and Meaning

- The speaker describes war as a battle against the weather and conditions.
- Focuses on the sheer monotony of daily life for many soldiers, as well as the harsh conditions they must endure
- The ideas of the old and warm reflect the delusional mind of a man dying from hypothermia and the ending focuses on the deaths of soldiers waiting for active conflict.

6b. Context and Purpose

- Owen wanted to draw attention to the suffering, monotony and futility of war.
- Written in 1917 before Owen went on to win the Military Cross for bravery, and was then killed in battle in 1918: the poem has authenticity as it is written by an actual soldier.
- Of his work, Owen said: "My theme is war and the pity of war".
- Despite highlighting the tragedy of war and mistakes of senior commanders, he had a deep sense of duty: "not loath, we lie out here" shows that he was not bitter about his suffering.

6c. Language

- '"Our brains ache" physical (cold) suffering and mental (PTSD or shell shock) suffering. - Semantic field of weather: weather is the enemy, the aggressor that attacks the soldiers.
- "The merciless iced east winds that knive us…" – personification (cruel and murderous wind); sibilance (cutting/slicing sound of wind); ellipsis (never-ending).
- The visual image of the men cowering away emphasises the dehumanising effects of war: 'We cringe in holes, back on forgotten dreams.'
- Rhetorical question conveys confusion and hopelessness: 'Is it that we are dying?'
- Metaphor 'slowly our ghosts drag home.' Adverb reinforce the men's lethargy; 'ghosts' suggesting the men are so exhausted and traumatised by war they no longer function as human beings.

6d. Structure and Form

- Contrast of cold, warm, cold imagery conveys suffering, delusions, death of the hypothermic soldier.
- Refrain "but nothing happens" creates circular structure implying never ending suffering.
- Rhyme scheme ABBA emphasises the monotony.
- Half rhymes ("nervous / knife us") only barely hold the poem together, like the men.

English - GCSE Anthology Power and Conflict War Poems

7. Storm on the Island by Seamus Heaney

7a. Content and Meaning

- The narrator describes how a rural island community prepared for a coming storm, and how they were confident in their preparations.
- When the storm hits, they are shocked by its power: its violent sights and sounds are described, using the metaphor of war.
- The final line of the poem reveals their fear of nature's power.

7b. Context and Purpose

- Seamus Heaney was Northern Irish and his poem was published in 1966 at the start of 'The Troubles' in Northern Ireland: a period of deep unrest and violence between those who wanted to remain part of the UK and those who wanted to become part of Ireland.
- The first eight letters of the title spell 'Stormont': this is the name of Northern Ireland's parliament.
- The poem conveys the power of nature but it might be a metaphor for the political turmoil that was building in the country at the time.

7c. Language

- 'Nor are there trees which might prove company': the island is a lonely, barren place. Nature is not a comfort here, but a violent aggressor.
- Violent verbs are used to describe the storm: 'pummels', 'exploding', 'spits'.
- Semantic field of war: 'Exploding comfortably' (with the oxymoron to contrast fear/safety); 'wind dives and strafes invisibly' (the wind is a fighter plane); 'We are bombarded by the empty air' (under ceaseless attack). This also reinforces the metaphor of war / troubles.
- Simile 'spits like a tame cat turned savage': compares the nature to an unpredictable animal that has turned on its owner.

7d. Structure and Form

- Written in blank verse and use of enjambment creates a conversational and anecdotal tone.
- The poem can split into three sections: Confidence: 'We are prepared:' (ironic) The violence of the storm: 'It pummels your house' Fear: 'it is a huge nothing that we fear.' The contrast between the opening confidence and the apprehensive ending emphasises the power of nature and the powerlessness of human beings.
- There is a turning point (a volta) in Line 14: 'But no:'. This monosyllabic phrase, and the caesura, reflects the final calm before the storm and the lines that follow reveal how dangerous nature can be.

7e. Key Quotations

- 'We are prepared.'
- 'Spits like a tame cat turned savage.'
- 'Strange, it is a huge nothing that we fear.'

8. Bayonet Charge by Ted Hughes

8a. Content and Meaning

- Describes the terrifying experience of 'going over the top': leaving a trench to charge directly at the enemy.
- Steps inside the body and mind of the speaker to show how this act transforms a soldier Hughes dramatises the struggle between a man's thoughts and actions.

8b. Context and Purpose

- Most- likely set in WWI.
- Hughes' father had survived WWI, and so he may have been drawing attention to the hardships of trench warfare.
- He draws a contrast between the idealism of patriotism and the reality of fighting and killing. ("King, honour, human dignity, etcetera")

8c. Language

- 'Patriotic tear… Sweating like molten iron': sense of duty turned into fear/ pain.
- 'Cold clockwork': plosive alliteration - soldier as part of a cold and uncaring machine of war.
- 'Yellow hare': impact of war on nature – the hare is distressed like the soldiers; sometimes seen as an omen of death in folklore.
- 'King, honour, human dignity, etcetera.' list and dismissive tone trivialises reasons for going to war – these are forgotten in the midst of battle.

8d. Structure and Form

- Begins 'in medias res': in the middle of the action, to convey shock and pace.
- Enjambment maintains momentum.
- Time stands still in the second stanza to convey the soldier's bewilderment and reflective thoughts. "His foot hung like statuary in midstride.": the caesura (full stop) jolts him back to reality.
- Shifts between the chaotic imagery of battle with the internal thoughts of the soldier = adds to the confusion.

8e. Key Quotations

- 'Suddenly he awoke and was running.'
- 'King, honour, human dignity, etcetera."
- "His terror's touchy dynamite."

9. Remains by Simon Armitage

9a. Content and Meaning

- The speaker describes shooting a looter dead in Iraq and how it has affected him, even when he returns home.
- Written to coincide with a TV documentary about those returning from war with PTSD.

Based on Guardsman Tromans, who fought in Iraq in 2003.

9b. Context and Purpose

- "These are poems of survivors – the damaged, exhausted men who return from war in body but never, wholly, in mind." Simon Armitage
- Poem coincided with increased awareness of PTSD amongst the military, and aroused sympathy amongst the public – many of whom were opposed to the war.
- Armitage shows show the reader that mental suffering can persist long after physical conflict is over.

9c. Language

- Title 'Remains' – double meaning - images/ suffering stays after the event; a person's dead body.
- 'Tosses his guts back into his body' - colloquial language suggests solider is desensitised; authentic voice
- 'He's here in my head when I close my eyes / dug in behind enemy lines' – metaphor for a 'war in his head'; the PTSD is entrenched.
- 'His bloody life in my bloody hands" – blood as symbol of guilt

9d. Structure and Form

- Monologue, told in the present tense to convey a flashback (a symptom of PTSD).
- First 4 stanzas are set in Iraq; last 3 are at home, showing the aftermath.
- 'But I blink / and he bursts again' mirrors the unstoppable nature of the memories; conveys his conversational tone and gives it a fast pace, especially when conveying the horror of the killing
- Repetition of 'Probably armed, possibly not' conveys guilt and bitterness.

9e. Key Quotations

- 'Tosses his guts back into his body'
- 'Probably armed, possibly not'
- 'His bloody life in my bloody hands'

English - GCSE Anthology Power and Conflict War Poems

10. Poppies by Jane Weir

10a. Content and Meaning

- A modern poem that offers an alternative interpretation of bravery in conflict; it focuses on a soldier's mother who is left behind and must cope with his possible death.
- The narration covers her visit to a war memorial, interspersed with images of the soldier's childhood and his departure for war.

10b. Context and Purpose

- Set around the time of the Iraq and Afghan wars, but the conflict is deliberately ambiguous to give the poem a timeless relevance to all mothers and families.
- There are hints of criticism of war, how soldiers can become intoxicated by the glamour or the military and the grief of loved ones after death.

10c. Language

- Contrasting semantic fields of home and childhood ('cat hairs', 'play at being Eskimos', 'bedroom') with war and injury ('blockade', 'bandaged', 'reinforcements')
- Aural (sound) imagery and metaphor: 'All my words flattened, rolled, turned into felt' shows pain and inability to speak, and 'I listened, hoping to hear your playground voice catching on the wind' shows longing for dead son.
- 'The world overflowing like a treasure chest' – simile suggests excitement and optimism of soldier, irony – son's life might end prematurely.

10d. Structure and Form

- This is an elegy, a poem of mourning.
- Strong sense of form despite the free verse, stream of consciousness.
- Addressing her son directly – poignant.
- Many lines include caesura – she is trying to remain composed, but cannot speak fluently as she is finding her emotions difficult to manage.

10e. Key Quotations

- "A split second and you were away, intoxicated."
- 'The world overflowing like a treasure chest'
- 'I listened, hoping to hear your playground voice catching on the wind.'

11. War Photographer by Carol Ann Duffy

11a. Content and Meaning

- Tells the story of a war photographer developing photos at home in England. As a photo develops he begins to remember and reflect on the horrors of war - painting a contrast to the safety of his dark room and his home.
- He appears to be returning to a warzone at the end of the poem

11b. Context and Purpose

- Duffy conveys both the brutality of war and the indifference of those who might view the photos in newspapers and magazines: those who live in comfort and are unaffected by war.
- Inspired to write this poem by her friendship with a war photographer, Duffy explores the challenge faced by these people whose job requires them to record terrible events without being able to directly help their subjects.
- The location is ambiguous and therefore universal.

11c. Language

- 'Spools of suffering set out in ordered rows': sibilance, adjective 'ordered' suggesting he is trying to organise and settle his thoughts, impose order on chaos
- 'He has a job to do': like a soldier, the photographer has a sense of duty.
- 'Running children in a nightmare heat': emotive imagery with connotations of hell.
- 'A half-formed ghost': metaphor highlights the death of the man; suggests he is haunted by the memory (PTSD?)
- 'Blood stained into a foreign dust': lasting impact of war.

11d. Structure and Form

- Final line – "he earns a living and they do not care": pronoun 'they' is ambiguous – it could refer to readers or the wider world, sense of frustration.
- Enjambment – reinforces the sense that the world is out of order and confused.
- Rhyme reinforces the idea that he is trying to bring order to a chaotic world – to create an understanding.
- Contrasts: imagery of rural England and nightmare war zones.

11e. Key Quotations

- "The cries of this man's wife."
- 'Fields which don't explode beneath the feet of running children in a nightmare heat.'
- 'He earns a living and they do not care.'

12. Tissue by Imtiaz Dharker

12a. Content and Meaning

- Two different meanings of 'Tissue' (homonyms) are explored: firstly, the various pieces of paper that control our lives (holy books, maps, grocery receipts); secondly, the tissue of a human body.
- The poet explores the paradox that although paper is fragile, temporary and ultimately not important, we allow it to control our lives.
- Also, although human life is much more precious, it is also fragile and temporary.

12b. Context and Purpose

- 'Tissue' is taken from a 2006 collection of poems that questions how well we know people around us.
- This particular poem also questions how well we understand ourselves and the fragility of humanity.

12c. Language

- Semantic field of light: ('Paper that lets light shine through', 'The sun shines through their borderlines', 'let the daylight break through capitals and monoliths') emphasises that light is central to life, a positive and powerful force that can break through 'tissue' and even stone statues. Nature as more powerful than man made constructions.
- 'Pages smoothed and stroked and turned': gentle verbs convey how important documents such as the Koran are treated with respect.
- 'Fine slips [...] might fly our lives like paper kites': this simile suggests that we allow ourselves to be controlled by paper.

12d. Structure and Form

- The short stanzas create many layers, which is a key theme of the poem (layers of paper and the creation of human life through layers).
- The lack of rhythm or rhyme creates an effect of freedom and openness.
- The final stanza has one line ('turned into your skin'): this line focuses on humans, and addresses the reader directly to remind us that we are all fragile and temporary
- Enjambment creates an effect of freedom and flowing movement.

12e. Key Quotations

- 'The sun shines through their borderlines'
- 'Fine slips [...] might fly our lives like paper kites'
- 'A structure never meant to last.'

English - GCSE Anthology Power and Conflict War Poems

13. The Emigree by Carol Rumens

13a. Content and Meaning

- An emigree' is a female who is forced to leave their county for political or social reasons.
- The speaker describes her memories of a home city that she was forced to flee. Despite the city's problems, her positive memories of the place cannot be forgotten

13b. Context and Purpose

- The home country of the speaker is not revealed – this ambiguity gives the poem a timeless relevance. Countless displaced people struggle as they are forced to leave their homes and Rumens explores the effects of conflict and the power of memory and identity.
- Increasingly relevant to many people in current world climate.

13c. Language

- "I left it as a child": ambiguous meaning – either she left when she was a child or the city was a child (it was vulnerable and she feels a responsibility towards it).
- "I am branded by an impression of sunlight": imagery of light - it will stay with her forever – and sunlight as symbol of hope and happiness.
- Personification of the city: "I comb its hair and love its shining eyes" (she has a maternal love for the city) and "My city takes me dancing" (it is romantic and passionate lover).
- "My city hides behind me": it is vulnerable and she is strong despite the reaction of people in her new home 'they circle me' – sense of intimidation.
- Semantic field of conflict: "Tyrant, tanks, frontiers"

13d. Structure and Form

- First person – validity as we hear the speaker's voice.
- The last word of each stanza is repeated "sunlight": reinforces the overriding positivity of the city and of the poem. Motif brings hope.
- The first two stanzas have lots of enjambment – conveys freedom.
- The final stanza has lots of full-stops – conveys that fact that she is now trapped.

13e. Key Quotations

- "There once was a country… I left it as a child."
- 'My city takes me dancing.'
- "My shadow falls as evidence of sunlight."

14. Checking Out Me History by John Agard

14a. Content and Meaning

- We hear the voice of a black man who is frustrated by the Eurocentric history curriculum in the UK – which pays little attention to the black history.
- Black history is quoted to emphasise its separateness and to stress its importance.

14b. Context and Purpose

- John Agard was born in the Caribbean in 1949 and moved to the UK in the 1970s.
- His poetry challenges racism and prejudice.
- This poem may, to some extent, have achieved its purpose: in 2016, a statue was erected in London of Mary Seacole.

14c. Language

- Imagery of fire and light to describe black historic figures: 'Toussaint de beacon', 'Fire-woman', 'sunrise', symbolises power, hope.
- Uses non-standard spelling ("Dem tell me wha dem want", to represent his own powerful accent and mixes Caribbean Creole dialect with standard English.
- 'I carving out me identity": metaphor for the painful struggle to be heard, and to find his identity.
- Repetition of 'Dem tell me' – inescapable nature of the education he feels is too narrow.

14d. Structure and Form

- Dramatic monologue, with a dual structure.
- Stanzas concerning Eurocentric history (normal font) are interspersed with stanzas on black history, italics to represent separateness and rebellion.
- Black history sections arranged as serious lessons; traditional history as nursery rhymes or fairytales (mocking).
- The lack of punctuation, stanzas in free verse, irregular rhyme scheme and use of Creole representing the narrator's rejection of the rules.

14e. Key Quotations

- 'Dem tell me Dem tell me Wha dem want to tell me'
- 'Mary Seacole… a yellow sunrise to the dying.'
- 'But now I checking out me own history I carving out me identity'

15. Kamikaze by Beatrice Garland

15a. Content and Meaning

- This poem explores a kamikaze pilot's journey towards battle, his decision to return, and how he is shunned when he returns home.
- As he looks down at the sea, the beauty of nature and memories of childhood make him decide to turn back.

15b. Context and Purpose

- In World War 2, Japanese Kamikaze pilots would fly manned missiles into targets such as ships.
- Cowardice or surrender was a great shame in wartime Japan; to surrender meant shame for you and your family, and rejection by society.

15c. Language

- The Japanese word 'kamikaze' means 'divine wind' or 'heavenly wind'.
- 'Powerful incantations' – incantations
- 'Dark shoals of fish flashing silver': sibilance and visual image links to a Samurai sword – conveys the conflict between his love for nature/life and his sense of duty.
- 'They treated him as though he no longer existed' - cruel irony – he chose to live but now must live as though he is dead.

15d. Structure and Form

- Narrative and speaker is third person, representing the distance between her and her father, and his rejection by society.
- Only full stop is at the end of stanza five: he has made his decision to turn back.
- Final two stanzas in italics, represent the consequence of his decision: his life has shifted and will no longer be the same.
- Moving final lines – shame and regret.

15e. Key Quotations

- 'A shaven head full of powerful incantations.'
- 'They treated him as though he no longer existed.'
- 'He must have wondered which had been the better way to die.'

English - GCSE Anthology Power and Conflict (Literature Paper 2, Section B)

16. Verbs for Analysis

conveys	suggests	highlights	evokes	compares
presents	implies	emphasises	conjures	contrasts
asserts	alludes to	underlines	establishes	juxtaposes
indicates	connotes	reiterates		mirrors
depicts				reflects
				parallels

17. Discourse markers for comparison

In contrast	Similarly
Conversely	In the same way
On the other hand	Likewise
Whereas	

18. Writing Your Answer

Either	Or
Compare poems throughout:	Compare in introduction then analyse two poems in turn:
Thesis Introduction summarising the poet's ideas, messages and context of both poems, setting out your comparative idea(s).	Thesis Introduction summarising the poet's ideas, messages and context of both poems, setting out your comparative idea(s).
Then three or four comparative what, how, why paragraphs:	Then three what, how, why paragraphs for the named poem**:**
Topic sentence *comparing a 'big idea' in both poems linked to your thesis.* What *is the writer telling the reader about this 'big idea'?* How *are they revealing information and creating effects for the reader? Quotation? Methods?* Why *have they chosen to do this? Purpose?* Discourse marker *and* What, how, why *for the second poem.*	What *is the writer telling the reader about this 'big idea'?* How *are they revealing information and creating effects for the reader? Quotation? Methods?* Why *have they chosen to do this? Purpose?* Then three what, how, why paragraphs for the second poem (as above), making links back to the first poem.

19. Subject Vocabulary

poem (noun) A piece of writing in which the words are arranged in separate lines and are chosen for their beauty and sound.
stanza (noun) A group of lines in a poem; a verse.
language (noun) Words or methods (techniques) used by writers to present their meanings or create effects.
tone (noun) The attitude a writer shows towards a topic using words.
imagery (noun) The use of language to create vivid pictures in the readers' minds.
structure (noun) The way the poet has organised the poem on the page, including stanza length, line length, title and ending.
connotations (noun) A feeling or idea that is suggested by a particular word.
noun (noun) A word that refers to a person, place, thing, event, substance, or idea e.g cat, Christmas.
abstract noun (noun phrase) A word that identifies a feeling or state of being e.g. love, peace.
verb (noun) A word or phrase that describes an action, condition, or experience e.g. run, am
adverb (noun) A word that adds to a verb, adjective or adverb to give more information e.g. quickly, spotlessly, often
adjective (noun) A word that describes a noun or pronoun e.g. tall, beautiful
non-standard spelling (noun) spelling that does not follow the rules of English grammar
personification (noun) Giving inanimate (not living) things human qualities or abilities
simile (noun) An expression including the words "like" or "as" to compare one thing with another
metaphor (noun) Comparing one thing to another directly – as if one thing is another – to highlight their similarities.
extended metaphor (noun phrase) a comparison of two things using a number of examples to highlight the similarities
symbol (noun) A character, idea, image or setting that represents a bigger idea
alliteration (noun) repetition of a letter sound in a series of words
sibilance (noun) Repetition of the letter sound 's' in a series of words
plosive sounds (noun phrase) Harsh, abrupt letter sounds e.g. d, t, k
enjambment (noun) No punctuation at the end of a line of poetry.
caesura (noun) Punctuation in the middle of a line of poetry.
rhyme (noun) The repetition of identical syllables sounds in different words, often at the ends of lines
volta (noun) A turn in the poem, when the subject and/or tone shifts
sonnet (noun) A 14 line love poem

English - Unseen Poetry Part 1 (Analysis) and Part 2 (Comparison) (Literature Paper 2, Section C)

1. How to Approach an Unseen Poem – SMILE!

S Structure	What is interesting about line length or stanza length? How does the poem begin and end? How does the poet use punctuation marks (or lack of!)?
M Meanings & messages	What is the poem about? Who or what does it focus on? What idea(s) are most important?
I Imagery	What are the most important images in the poem? How do they support the poet's idea(s)?
L Language	Which words are most important? What are their meanings and connotations? Has the writer used any similes, metaphors or personification? Are their sounds important? What tone does the poet adopt?
E Effects	What does the poet want the reader to think about or realise? What do they want the reader to imagine, picture or feel? How do they want us to

2. Writing Your Answer

Introduction summarising the poet's ideas, meanings and messages.

Then, extended what, how, why paragraphs.

WHAT is the writer saying about the main protagonist (character)/ theme/ setting?

HOW are they revealing information and creating effects for the reader? Quotation? Language methods?

WHY have they chosen to do this? Purpose?

3. Verbs for Analysis

conveys
presents
asserts
indicates
depicts
suggests
implies
alludes to
connotes
highlights
emphasises
underlines
reiterates
evokes
conjures
establishes
compares
contrasts
juxtaposes
mirrors
reflects
parallels
adumbrates

4. Subject Vocabulary

4a = poem (noun) A piece of writing in which the words are arranged in separate lines and are chosen for their beauty and sound.
4b = stanza (noun) A group of lines in a poem; a verse.
4c = language (noun) Words or methods (techniques) used by writers to present their meanings or create effects.
4d = tone (noun) The attitude a writer shows towards a topic using words.
4e = imagery (noun) The use of language to create vivid pictures in the readers' minds.
4f = structure (noun) The way the poet has organised the poem on the page, including stanza length, line length, title and ending.
4g = connotations (noun) A feeling or idea that is suggested by a particular word
4h = noun (noun) A word that refers to a person, place, thing, event, substance, or idea e.g. cat, Christmas.
4i = abstract noun (noun phrase) A word that identifies a feeling or state of being e.g. love, peace.
4j = verb (noun) A word or phrase that describes an action, condition, or experience e.g. run, am
4k = adverb (noun) A word that adds to a verb, adjective or adverb to give more information e.g. quickly, spotlessly, often
4l = adjective (noun) A word that describes a noun or pronoun e.g. tall, beautiful
4m = superlative (noun) The most extreme form of an adjective e.g. calmest, loudest
4n = personification (noun) Giving inanimate (not living) things human qualities or abilities
4o = simile (noun) An expression including the words "like" or "as" to compare one thing with another
4p = metaphor (noun) Comparing one thing to another directly – as if one thing is another – to highlight their similarities.
4q = extended metaphor (noun phrase) A comparison of two things using a number of examples to highlight their similarities
4r = symbol (noun) A character, idea, image or setting that represents a bigger idea
4s = alliteration (noun) Repetition of a letter sound in a series of words
4t = sibilance (noun) Repetition of the letter sound 's' in a series of words
4u = plosive sounds (noun phrase) Harsh, abrupt letter sounds e.g. d, t, k
4v = enjambment (noun) No punctuation at the end of a line of poetry.
4w = caesura (noun) Punctuation in the middle of a line of poetry.
4x = rhyme (noun) The repetition of identical syllables sounds in different words, often at the ends of lines
4y = rhythm (noun) The beat and pace of a poem and is created by the pattern of stressed and unstressed syllables

English - Section A – READING 40 marks (50% of Language Paper 1 – 1 hour)

1. The questions

Question 1: Select four true statements [4]

- ✓ 5 minutes
- ✓ Mark out the line numbers.
- ✓ Use 'T' or 'F' next to the statements before making your final decisions.
- ✓ Shade the oval once you are certain of your answers.

Question 2: Summary question inference. compare both sources – quotes + [8]

- ✓ 10 minutes
- ✓ Focusing on the narrow focus in the question, highlight key quotes.
- ✓ Write your answer using two SQUID paragraphs.

Question 3: Language [12]

- ✓ 10 minutes
- ✓ Select important language methods features to analyse, including word choice.
- ✓ Write your answer using What, How, Why paragraphs.

Question 4: Comparing writers' viewpoints and methods [16]

- ✓ 20 minutes
- ✓ Use all of both sources
- ✓ Compare viewpoints and methods used to present these viewpoints
- ✓ Language, tone, structure
- ✓ VEMAD > connective > VEMAD x3
- ✓ VEMAD= Viewpoint, Evidence, Method, Analysis, Difference

2. Sentence Starters for Question 2 (SQUID)

Whilst source A...source B...which shows...

The writer in source A...however in source B this is...

Although source B presents...source A portrays...

In contrast to source A, source B...

This differs to source A as...which implies...

The...in source A are...in comparison to source B...

3. Words to identify writers' viewpoints

☺	
Composed	feeling in control and calm
Content	quietly happy
Assured	confident
Untroubled	having no worries
Curious	interested and wanting to know more
Captivated	having your attention held by something beautiful or exciting
Delighted	very pleased
Euphoric	extremely happy or excited
Grateful	thankful
Optimistic	hopeful and confident about the future

Remorseful	sorry for your actions, guilty
Suspicious	being unsure and cautious about something or someone
Perplexed	confused
Indignant	unwilling to believe something
Unsettled	on edge, slightly worried or scared
Overwhelmed	feeling sudden, strong emotions
Dejected	sad and lacking in hope
Indifferent	not caring about something
Disgusted	a strong feeling of dislike for something unpleasant
Enraged	extremely angry
Pessimistic	negative about the future, believing the worst will happen

4. Verbs for Analysis

Shows For explicit/ obvious meanings		Suggests For what the writer wants us to work out based on clues, inferences implicit meanings		Highlights For ideas made very clear and stressed by the writer as very important		Links to For making connections between quotations from different parts of a text		Other
• Reveals • Demonstrates • Exposes • Tells the reader/ audience	• Conveys • Presents • Depicts	• Implies • Hints at • Connotes	• Intimates • Indicates • Alludes to	• Emphasises • Underlines • Reiterates (for something shown more than once)	• Accentuates • Underscores	• Relates to • Contrasts • Echoes • Juxtaposes	• Mirrors • Diverges from • Augments • Develops	• Evokes • Establishes • Symbolises

English - Language Paper 2

5. Connectives for Developing Ideas

To order ideas:	To add:		To add a different idea:		To sum up:
Firstly, Secondly	This also	Therefore	By contrast	On the other hand	Ultimately
Finally	In addition	Consequently	On the contrary	Conversely	Above all
Lastly	Furthermore	What is more	Although	Despite	It is evident that
To conclude	Moreover	Then again	However		
	Again	Subsequently	Alternatively		

6. Inference (Q2)

Inference means working things out based on the evidence in a text. It does not mean writing the meaning of a quotation – this is paraphrasing.

Example:

The writer describes the footballer as "assuring his place in history with the quickest goal". We can infer that he is an incredibly skilled footballer and that people will admire him for a long time for his ability. We might also infer that he has worked hard to hone his skills and develop his strategy on the pitch.

7. Language Methods Terms (use these in Q3 and Q4)

noun	words that name a person, thing, idea or feeling
adjectives	words that describe a noun
verb	describes an action, event, situation or change
adverb	gives information about a verb; a word that tells you how something is done
sensory imagery	when the writer uses the senses to create pictures in our minds
repetition	Using a word or phrase more than once
simile	Something is compared to something else using the words 'like' or 'as'
metaphor	something is described as something else
personification	giving human traits to something non-human
semantic field	a set of words related in meaning
alliteration	repetition of the same sound at the start of a series of words
sibilance	repetition of the 's' sound at the start of a series of words
plosive sounds	harsh letter sounds such as 't', 'd' and 'k'
onomatopoeia	sound words; words that sound like their meaning
pathetic fallacy	weather reflects the mood
hyperbole	purposely exaggerated ideas
juxtaposition	purposely exaggerated ideas
symbol	the use of characters, events or ideas to represent something broader
pathos	evoking strong emotions in the reader e.g. sympathy or sadness
ethos	using information or research to present the writer as knowledgeable and credible
logos	using logic to give ideas that cannot be argued with
rhetorical question	a question worded in such a way to make a reader think from a particular perspective
direct address	using the word 'you' to speak directly to the reader
personal anecdote	using the word 'you' to speak directly to the reader
triple / tricolon	using three words or short phrases to emphasise a point
reported speech	words spoken by someone, marked out using speech marks
analogy	a comparison between things that have similar features e.g. you might use the analogy of a box of chocolates to explain the variety of life

8. Structure Methods Terms (use these for Q4)

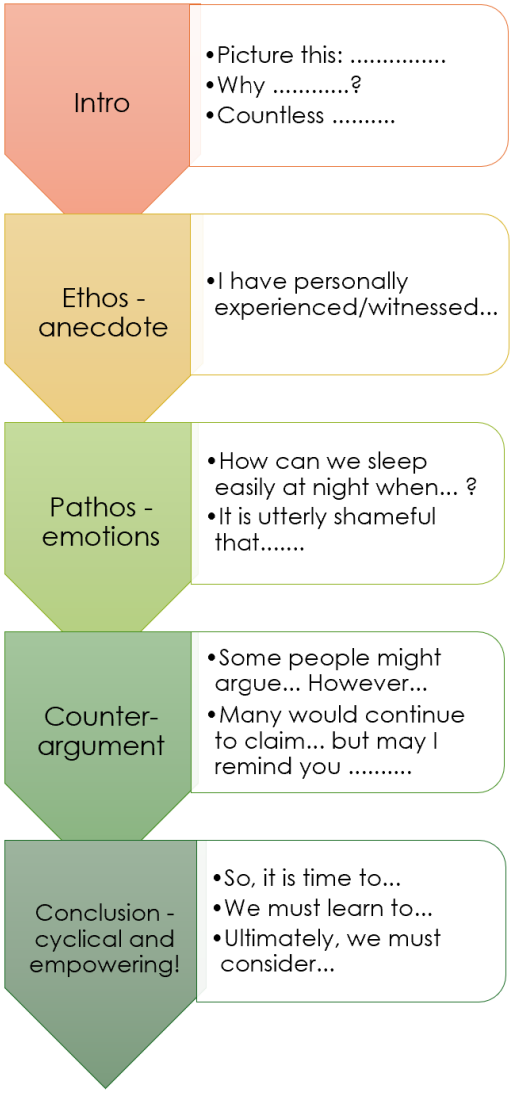
opening	the way the extract begins
character introduction	the first description of a person in the text
cyclical	ends the same way it begins
focusing attention	our attention is aimed at something
building	when an idea/tension is increased
developing	an earlier point is extended
narrative shift	a swift or change of focus
zooming in	detailed description of something
zooming out	showing the reader the bigger picture
flash-forward	presents future events
foreshadowing	hints at what's to come
climax	the most intense point
dialogue	lines spoken by characters
flashback	presents past events
internal thoughts	description of what a character is thinking or feeling
external action	description of events outside the character
ending	the last ideas/events in the Source

English – Language Paper 2 Section B – WRITING 40 marks (50% of Language Paper 1 – 45 minutes)

9. Approaching the Question

Plan – 5 minutes > Write 30 minutes > Proof-read 5 minutes

10. Suggested Structure



11. The Mark Scheme

Have you:

Content and Organisation /24	a) Register matches audience and purpose	• Used a descriptive, creative style? • Included a range of descriptive methods, including simile, metaphor, personification and imagery?
	b) Vocabulary and linguistic devices	• Used a range of interesting and challenging word choices? • Used thoughtful, challenging descriptive methods,
	c) Structural features	• Crafted an engaging opening and a thoughtful ending? • Included foreshadowing, a flashback or flashforward, a motif or circular structure?
	d) Ideas	• Included interesting and convincing ideas? • Linked your ideas together coherently throughout the narrative or description?
	e) Paragraphing	• Used paragraphs in your extended writing and linked them together? • Used a range of paragraph lengths for effect?
Technical Accuracy /16	f) Sentence demarcation	• Ended your sentences correctly, using a full stop, exclamation mark or question mark? • Avoided comma splicing?
	g) Punctuation	• Used basic punctuation correctly, including full stops, commas and capital letters? • Used more complex punctuation e.g. semi-colon, colon and dash?
	h) Sentence forms	• Used a range of minor, simple, compound and complex sentences? • Used a range of sentence starters?
	i) Standard English	• Used formal word choices? • Used grammatically correct phrases?
	j) Spelling	• Used correct spellings? • Selected correct homophones e.g. there/their/they're; to/too/two; weather/whether.
	k) Vocabulary	• Used a range of challenging word choices precisely?

English – Language Paper 2 - Section B – WRITING 40 marks (50% of Language Paper 1 – 45 minutes)

12. Vocabulary

☺	☹
exhilarating	infuriating
inspiring	exasperating
gratifying	outrageous
enchanting	maddening
Uplifting	enraging
empowering	appalling
heartening	irksome
delightful	galling
captivating	disheartening
refreshing	Disappointing

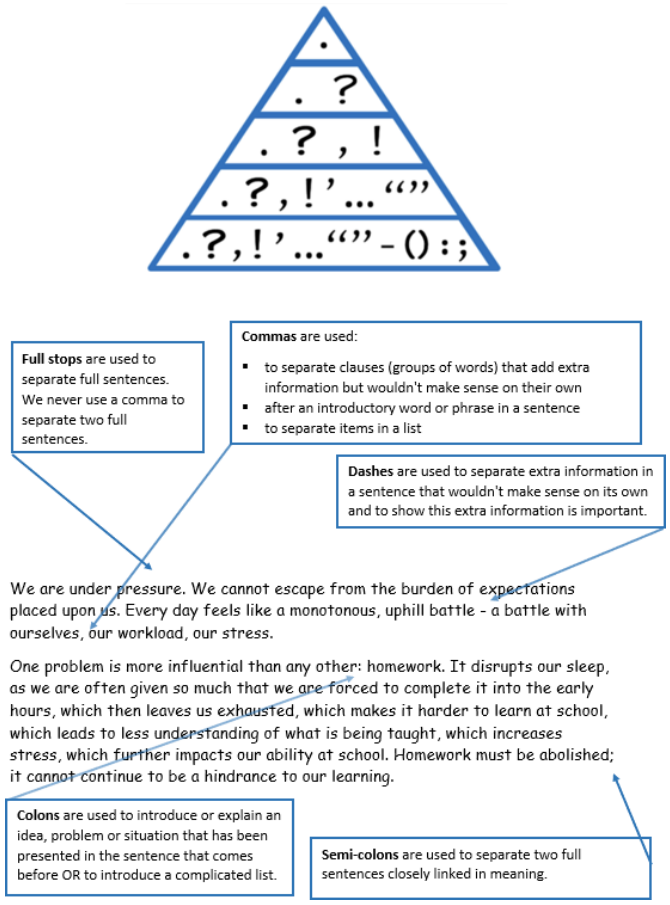
Fantastic phrases:

Herculean effort a task that requires an extraordinary amount of effort or determination to complete, alluding to the ancient Greek hero Hercules

Sisyphean task a task that seems both endless and pointless. From the Greek myth of Sisyphus, a figure forced by the gods to roll a heavy boulder up a hill, only for it to roll back down each time, forcing him to repeat the task for eternity.

Naysayers will claim... some people will always share a negative opinion about something

13. Punctuation



14. Sentence Structures

Triple

Crisp packets, coffee cups and chewing gum are the most common things discarded on our street – just minutes from the coast - and left to blow into the ocean.

Double adjective starter

Unsightly and dangerous, litter is the scourge of our society

Brackets although

Some young people do take this issue seriously (although not everyone credits them with this) and there is already an emerging positive impact.

Question

Why are we not able to reject this way of living?

Colon one word/phrase

We can adopt one lifestyle change immediately: recycling.

Verb beginning

Showing your support is simple.

Anaphora

Imagine a world in which forest paths were lined with greenery, not plastic. Imagine a world where flowers were not outshone by a pile of lurid dog poo bags. Imagine a world where you could breathe fresh, clean air.

The more the more the more

The more litter that is dropped, the more ugly our world becomes, and the more difficult it is to change our habits.

Maths

1.Number

Topic	Topic Code	Rag Rating		
		R	A	G
Ordering positive integers	U600			
Ordering decimals	U435			
Ordering negative numbers	U947			
Adding and subtracting positive integers	U417			
Multiplying and dividing positive integers	U127, U453			
Adding and subtracting negative numbers	U742			
Multiplying and dividing negative numbers	U548			
Adding and subtracting decimals	U478			
Multiplying and dividing with place value	U735			
Multiplying and dividing with decimals	U293, U868			
Order of operations	U976			
Prime numbers, prime factorisation	U236, U739			
Factors, multiples, HCF and LCM	U211, U751, U529			
Powers and roots	U851			
Using standard form	U330, U534			
Calculating with standard form	U264, U290, U161			
Equivalent fractions and simplifying fractions	U704, U646			
Mixed numbers and improper fractions	U692			
Ordering fractions	U746			
Addition and subtraction of fractions	U736, U793			
Multiplication and division of fractions	U475, U544			
Converting and ordering fractions, decimals and percentages	U888, U594			
Fractions of amounts	U881, U916			
Percentages of amounts	U554, U349			
Percentage change	U773, U671			
Reverse percentages	U286, U278			
Simple interest	U533			
Rounding	U480, U298			
Rounding to significant figures	U731, U965			
Estimating answers	U225			
Value for money	M681			

2. Statistics

Topic	Topic Code	Rag Rating		
		R	A	G
Collecting data, frequency tables	U322, U120			
Two-way tables	U981			
Bar charts	U363, U557			
Pictograms	U506			
Pie charts	U508, U172			
Stem and leaf diagrams	U200, U909			
Mode	U260			
Mean	U291			
Median	U456			
Range	U526			
Choosing averages	U717			
Scatter graphs	U199, U277, U128			

3. Ratio and proportion

Topic	Topic Code	Rag Rating		
		R	A	G
Simplifying ratios	U687			
Sharing amounts in a ratio	U753, U577			
Converting between ratios, fractions and percentages	U176			
Direct proportion	U721, U640			
Inverse proportion	U357, U364			
Proportion graphs	U238			
Units of measure: Length, Mass and Capacity	U102, U388			
Units of measure: Time	U902			
Units of measure: Area	U248			
Currency conversion	U610			
Conversion graphs	U652, U638, U862			
Compound units: Speed	U151			

Maths

4.Probability

Topic	Topic Code	Rag Rating		
		R	A	G
Probability scale	U803			
Probability of single events	U408, U510, U683			
Experimental probability	U580			
Expected outcomes	U166			
Listing elements in a set	U748, U296			
Probability from Venn diagrams	U4765			
Frequency trees	U280			
Sample space diagrams	U104			
Tree Diagrams	U558, U729			

5. Algebra

Topic	Topic Code	Rag Rating		
		R	A	G
Algebraic expressions	U322, U120			
Collecting like terms	U981			
Substitution	U363, U557			
Expanding brackets	U506			
Factorising expressions	U508, U172			
Index laws	U200, U909			
Changing the subject	U260			
Coordinates	U291			
Midpoints	U456			
Plotting straight line graphs	U526			
Equations of straight line graphs	U717			
Parallel lines	U199, U277, U128			
Distance-time graphs	U199, U277, U128			
Quadratic graphs	U199, U277, U128			
Linear equations	U199, U277, U128			
Quadratic expressions and equations	U199, U277, U128			
Linear sequences	U199, U277, U128			
Other sequences	U199, U277, U128			

6. Geometry

Topic	Topic Code	Rag Rating		
		R	A	G
Properties of 2D shapes	U121, U849			
Properties of 3D shapes	U719			
Nets of 3D shapes	U761			
Angles: Measuring, Drawing and Estimating	U447			
Angle on a line and about a point	U390			
Vertically opposite angles	U730			
Angles on parallel lines	U826			
Angles in a triangle	U628			
Combining angle facts	U655			
Angles in a quadrilateral	U732, U329			
Angles in polygons	U427			
Bearings	U525, U107			
Translations	U196			
Reflections	U799			
Enlargements	U519			
Rotations	U696			
Congruence	U790, U866			
Area and perimeter of simple shapes	U993, U970, U351, U226			
Area of triangles, parallelograms and trapeziums	U945, U575, U424, U265, U343			
Circles	U767			
Circumference	U604, U221			
Circle area	U950, U373			
Surface area	U929, U259, U871			
Volume of cuboids	U786			
Volume of prisms and cylinders	U174, U915			
Similar shapes	U551, U578			
Scale diagrams	U257			

Maths - Higher

1.Number

Topic	Topic Code	Rag Rating R	A	G
Calculating with roots and fractional indices	U851, U985, U772, U299			
Converting recurring decimals to fractions	U689			
Surds	U338, U663, U872, U499			
Rationalising the denominator	U707, U281			
Error intervals	U657, U301, U587			

2. Statistics

Topic	Topic Code	Rag Rating R	A	G
Averages	U877, U717			
Cumulative frequency diagrams	U182, U642			
Box plots	U879, U837, U507			
Frequency polygons	U840			
Histograms	U814, U983, U267			
Capture-recapture	U328			

3. Probability

Topic	Topic Code	Rag Rating R	A	G
Product rule for counting	U369			
Conditional probability	U246, U821, U806			
Probability from Venn diagrams	U476, U748, U699			

4. Geometry

Topic	Topic Code	Rag Rating R	A	G
Congruence proofs	U866, U887			
Enlargements	U134			
Describe combined transformations	U766			
Circle theorems: Angles inside a circle	U459, U251			
Circle theorems: Tangents and chords	U489, U130			
Circle theorems: Tangents and chords	U808			
Prove circle theorems	U807			
Volume of frustums	U350			
Volume: Problem solving	U543, U426			
Similar Shapes: Area and volume	U630, U110			
Pythagoras' Theorem in 2D and 3D	U385, U541			
Right-angled trigonometry: Problem solving	U319, U283, U545, U967			
3D trigonometry	U170			
The area rule	U592			
Sine rule	U952			
Cosine rule	U591			
Trigonometry and bearings	U164			
Vectors problems	U781, U560			

5. Algebra

Topic	Topic Code	Rag Rating R	A	G
Expanding triple brackets	U606			
Operations with algebraic fractions	U685, U457, U824			
Factorising quadratic expressions: ax2+bx+c	U858			
Simplifying algebraic fractions	U294			
Factorising to solve quadratics equations	U228, U960			
Factorising to solve quadratics equations	U665			
Completing the square to solve quadratics	U397, U589			
Quadratic equations in context	U150			
Quadratic simultaneous equations	U547			
Index laws	U235, U694, U662			
Equation of a straight line: Perpendicular lines	U898			
Quadratic graphs: Turning points	U769			
Quadratic simultaneous equations on graphs	U875			
Exponential graphs	U229			
Exponential growth and decay problems	U988			
Trigonometric graphs	U450			
Graph transformations	U598, U487, U455			
Velocity-time graphs	U937, U562, U611			
Rate of change graphs	U638, U652, U862			
Estimating gradient from a curve	U800			
Estimating area under a curve	U882			
Equation of a circles and tangents	U567			
Linear inequalities as graph regions	U747			
Quadratic inequalities	U133			
Functions	U637, U895, U448, U996			
Recurrence relations	U171			
Quadratic sequences	U206			
Iteration and numerical methods	U434, U168			
Algebraic proof	U582			

Foundation Tier Formulae Sheet

Perimeter, area and volume

Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

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

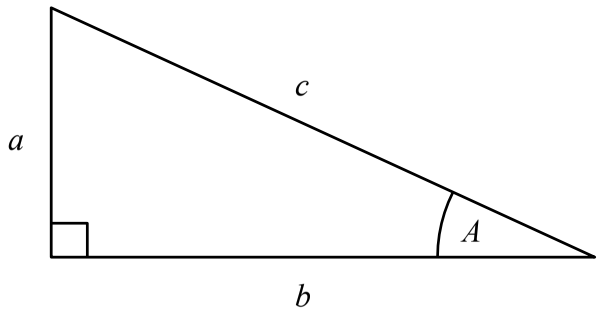
Volume of a prism = area of cross section × length

Where r is the radius and d is the diameter:

Circumference of a circle = $2\pi r = \pi d$

Area of a circle = πr^2

Pythagoras' Theorem and Trigonometry



In any right-angled triangle where a, b and c are the length of the sides and c is the hypotenuse:

$a^2 + b^2 = c^2$

In any right-angled triangle ABC where a, b and c are the length of the sides and c is the hypotenuse:

$\sin A = \frac{a}{c}$ $\cos A = \frac{b}{c}$ $\tan A = \frac{a}{b}$

Compound Interest

Where P is the principal amount, r is the interest rate over a given period and n is number of times that the interest is compounded:

Total accrued = $P\left(1 + \frac{r}{100}\right)^n$

Probability

Where P (A) is the probability of outcome A and P (B) is the probability of outcome B:

P (A or B) = P (A) + P (B) – P (A and B)

Higher Tier Formulae Sheet

Perimeter, area and volume

Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

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

Volume of a prism = area of cross section × length

Where r is the radius and d is the diameter:

Circumference of a circle = $2\pi r = \pi d$

Area of a circle = πr^2

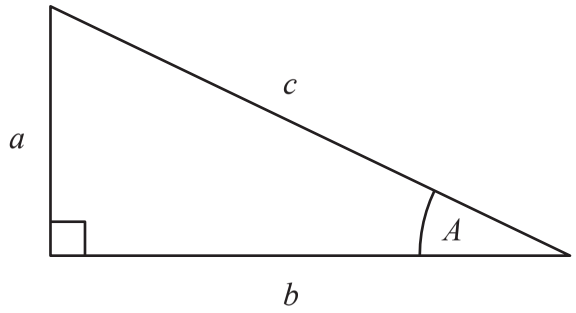
Quadratic formula

The solution of $ax^2 + bx + c = 0$

where $a \neq 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Pythagoras' Theorem and Trigonometry

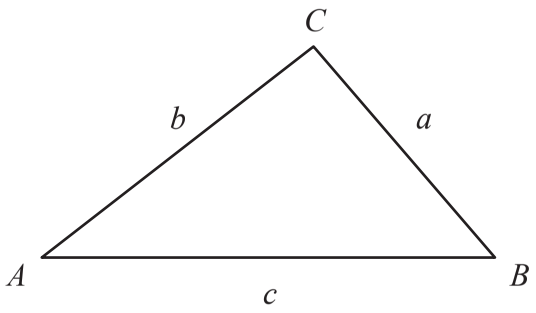


In any right-angled triangle where a, b and c are the length of the sides and c is the hypotenuse:

$a^2 + b^2 = c^2$

In any right-angled triangle ABC where a, b and c are the length of the sides and c is the hypotenuse:

$\sin A = \frac{a}{c}$ $\cos A = \frac{b}{c}$ $\tan A = \frac{a}{b}$



In any triangle ABC where a, b and c are the length of the sides:

sine rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

cosine rule: $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2}\,a\,b \sin C$

Compound Interest

Where P is the principal amount, r is the interest rate over a given period and n is number of times that the interest is compounded:

Total accrued = $P\left(1 + \frac{r}{100}\right)^n$

Probability

Where P (A) is the probability of outcome A and P (B) is the probability of outcome B:

P (A or B) = P (A) + P (B) – P (A and B)

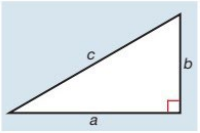
P (A and B) = P (A given B) P(B)

Maths - Key formulae

1. Pythagoras

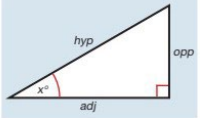
Pythagoras' Theorem

For a right-angled triangle,
$a^2 + b^2 = c^2$



Trigonometric ratios (*new to F*)

$\sin x^o = \frac{opp}{hyp}$, $\cos x^o = \frac{adj}{hyp}$, $\tan x^o = \frac{opp}{adj}$

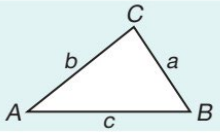


2. Trigonometric formulae

Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle $= \frac{1}{2} ab \sin C$

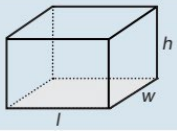


Foundation tier formulae

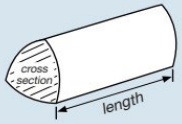
Higher tier formulae

3. Volumes

Cuboid = $l \times w \times h$

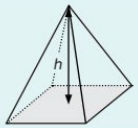


Prism = area of cross section × length



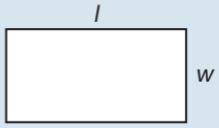
Cylinder = $\pi r^2 h$

Volume of pyramid = $\frac{1}{3}$ × area of base × h

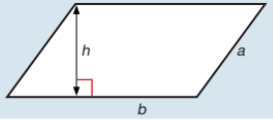


4. Areas

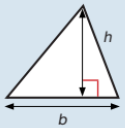
Rectangle = $l \times w$



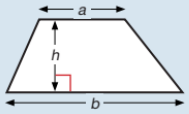
Parallelogram = $b \times h$



Triangle = $\frac{1}{2} b \times h$



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

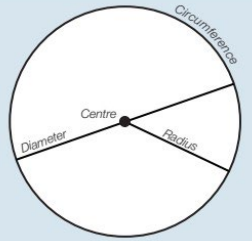


5. Circles

Circumference = $\pi \times$ diameter, $C = \pi d$

Circumference = $2 \times \pi \times$ radius, $C = 2\pi r$

Area of a circle = π x radius squared $A = \pi r^2$



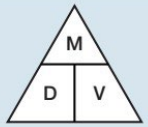
6. Compound measures

Speed

$\text{speed} = \frac{\text{distance}}{\text{time}}$

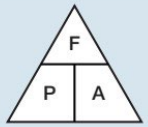
Density

$\text{density} = \frac{\text{mass}}{\text{volume}}$



Pressure

$\text{pressure} = \frac{\text{force}}{\text{area}}$

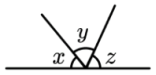
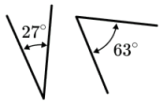
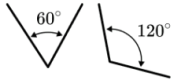
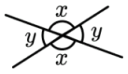


7. Quadratic equations

The Quadratic Equation

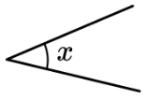
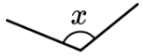
The solutions of $ax^2 + bx + c = 0$,
where $a \neq 0$, are given by $x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$

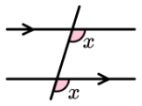
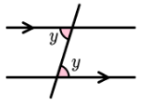
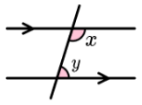
Maths – Angle facts

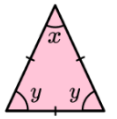
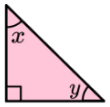
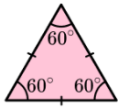
Angle Rule	Description	Diagram
Angles on a straight line	The sum of angles on a straight line is 180°. $x + y + z = 180$	
Angles at a point	The sum of angles at a point is 360°. $w + x + y + z = 360$	
Complementary angles	The sum of complementary angles is 90°. These angles do not need to be together and form a right angle. If any two angles sum to 90° they are complementary.	
Supplementary angles	The sum of supplementary angles is 180°. These angles do not need to be together on a straight line. If any two angles sum to 180° they are supplementary.	
Vertically opposite angles	Vertically opposite angles are equal in size.	

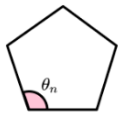
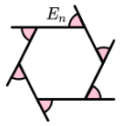
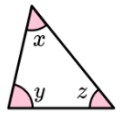
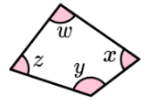
The sum of angles in a quadrilateral is 360°.

Type of quadrilateral	Angle property
Square / Rectangle	All four angles are equal to 90°
Parallelogram / Rhombus	Two pairs of opposite angles are equal
Kite / Arrowhead	One pair of equal angles
Trapezium	Two pairs of co-interior angles (see co-interior angles in parallel lines below)

Type of Angle	Description	Diagram
Acute angle	$0 \leq x^\circ < 90$	
Right angle	90°	
Obtuse angle	$90 < x^\circ \leq 180$	
Reflex angle	$180 < x^\circ \leq 360$	

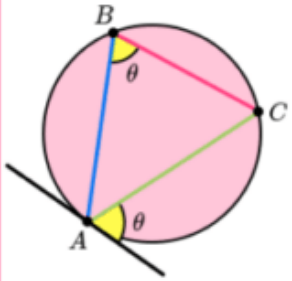
Corresponding angles	Corresponding angles are equal in size.	
Alternate angles	Alternate angles are equal in size.	
Co-interior angles	The sum of co-interior angles is 180°. $x + y = 180$	

Type of Triangle	Angle property	Diagram
Isosceles	The two base angles are equal	
Right angle	One angle is equal to 90°	
Equilateral	All three angles are equal to 60°	
Scalene	Three different angles (with no angle equal to 90°)	

Interior angles of polygons	The sum of interior angles of any polygon is equal to $180(n-2)$ for an n-sided shape.	
Exterior angles of polygons	The sum of exterior angles of any polygon is 360°.	
Angles in a triangle	The sum of angles in a triangle is 180°. $x + y + z = 180$	
Angles in a quadrilateral	The sum of angles in a quadrilateral is 360°. $w + x + y + z = 360$	

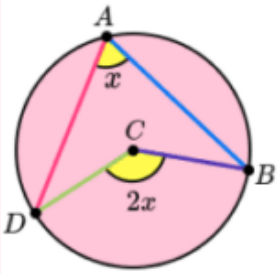
Circle Theorems

Alternate segment theorem



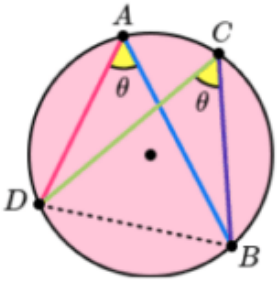
The angle that lies between a tangent and a chord is equal to the angle subtended by the same chord in the alternate segment.

Angle at the centre theorem



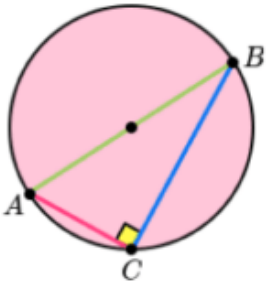
The angle at the centre is twice the angle at the circumference.

Angles in the same segment theorem



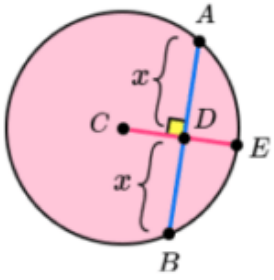
Angles in the same segment are equal.

Angles in a semicircle



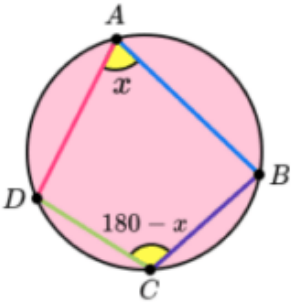
The angle in a semicircle is 90 degrees.

Chord of a circle



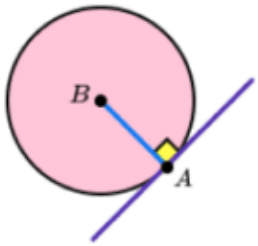
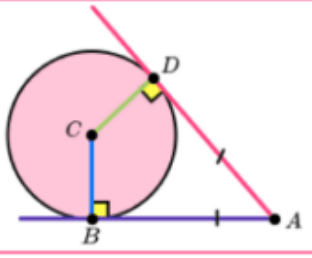
The perpendicular from the centre of a circle to a chord bisects the chord (splits the chord into two equal parts).

Cyclic quadrilateral



The opposite angles in a cyclic quadrilateral total 180°.

Tangent of a circle

Diagram A	Diagram B
	

A. The angle between a tangent and radius is 90 degrees.
B. Tangents which meet at the same point are equal in length.

Maths

Command word	Meaning
Calculate	A calculator and some workings will be needed
Change	Usually convert from unit to another, either using known metric conversions of the use of a conversion graph
Complete	Fill in missing values
Describe	Write a sentence that gives the features of the situation
Draw	Produce an accurate drawing
Draw a sketch off.../Sketch	Produce a drawing that does not have to be drawn to scale or a graph that is drawn without working out each coordinate
Expand	Remove brackets
Expand and simplify	Remove brackets and collect the like terms
Explain	Write a sentence of mathematical statement to show how you got to your answer or reached your conclusion
Express	Re-write in another form, some working may be needed
Factorise	Insert brackets by taking out common factors
Factorise fully	Inset brackets by taking out all the common factors
Find	Some working will be needed to get to the final answer
Give a reason	Some working will be needed to get to the final answer
Justify	Must be clear and accurate reasons
Prove	More formal than “show”, all steps must be present. In the case of a geometrical proof, reasons must be given
Show	All workings need to get a given answer or complete a diagram to show given information
Simplify	Simplify the given expression
Solve	Simplify the given expression
Write down	No working is needed

Maths

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

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

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

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

Useful features on your calculator:

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

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

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

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

°'": This is the mean average time button and can do conversions between time units, as well as calculations with different times

Fraction button: can be used for any calculations with fractions

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

Science

Trilogy Combined:
6 papers- 70 marks each

Triple Science:
6 papers- 100 marks each

Biology Paper 1 (13/5/25):

- Cell Biology
- Organisation
- Infection and Response
- Bioenergetics

Chemistry Paper 1 (19/5/25):

- Atomic structure and the periodic table
- Bonding, structure and properties of matter
- Quantitative chemistry
- Chemical changes
- Energy Changes

Physics Paper 1 (22/5/25):

- Energy
- Electricity
- Particle model of matter
- Atomic Structure

Biology Paper 2 (9/6/25):

- Homeostasis and response
- Inheritance, variation and evolution
- Ecology

Chemistry Paper 2 (13/6/25):

- Rate and extent of chemical change
- Organic chemistry
- Chemical analysis
- Chemistry of the atmosphere
- Using resources

Physics Paper 2 (16/6/25):

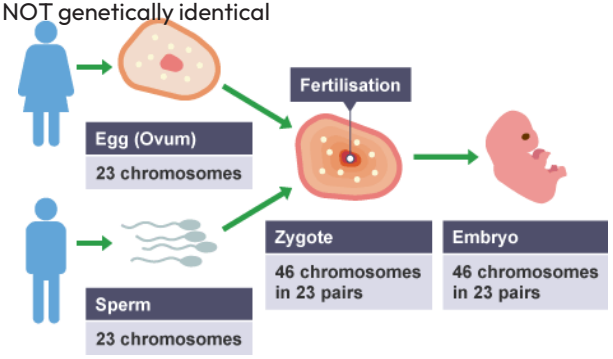
- Forces
- Waves
- Magnetism and electromagnetism
- Space (triple only)

Science - Inheritance, variation and evolution

1. Key Terms	Description
Asexual reproduction	Type of reproduction involving only one parent
Meiosis	A type of cell division which produces daughter cells with genetically varied DNA to the parent
Mitosis	A type of cell division which produces daughter cells identical to the parent
Sexual reproduction	Type of reproduction involving two parents
Species	A type of organism that can produce a fertile offspring
Gene	Small section of DNA on a chromosome that codes for a particular characteristic
Alleles	Different versions of the same genes

2. Asexual and Sexual Reproduction

Sexual reproduction involves 2 parents and produces offspring that are NOT genetically identical

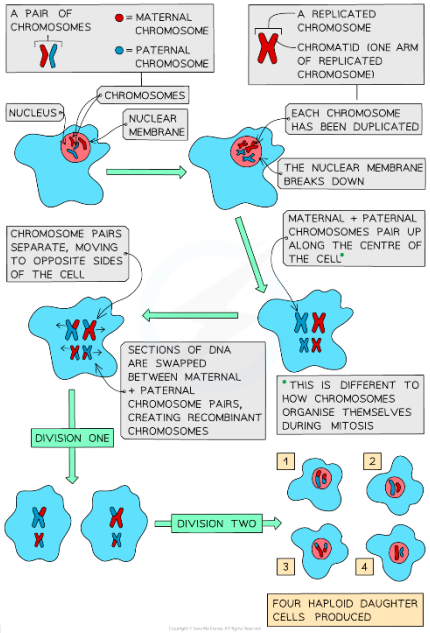


Asexual reproduction involves 1 parent cell and produces genetically identical offspring

3. Meiosis

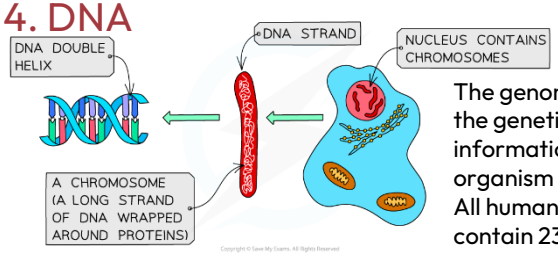
Used to produce gametes:

- Chromosomes are duplicated
- Chromosomes line up in the centre and 2 new cells are formed
- Chromosomes line up in centre and are separated again
- 4 haploid daughter cells produced (only contain 23 individual chromosomes)



This is important because gametes are involved in fertilisation

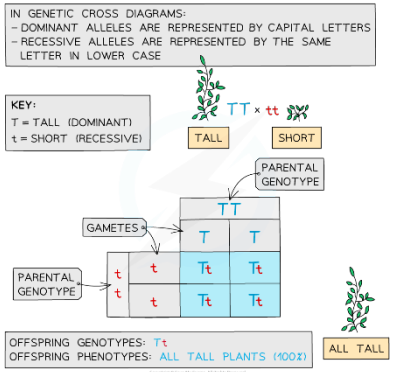
4. DNA



The genome is all the genetic information an organism contains
All humans contain 23 pairs

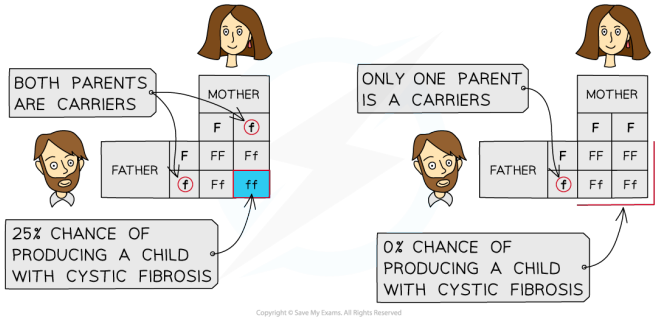
5. Inheritance

All organisms inherit 2 alleles (different version of the same gene)- 1 from each parent
Some are dominant (if present, are seen in the phenotype) or recessive (only seen in the phenotype is homozygous recessive)



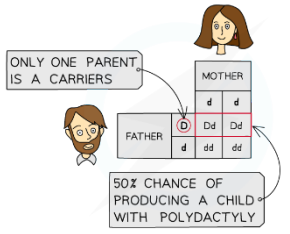
6. Inherited disorders

Cystic fibrosis is caused by a recessive allele, so offspring will only suffer if they have homozygous recessive genotype (ff).
If you have the recessive allele but do not suffer, you are a carrier



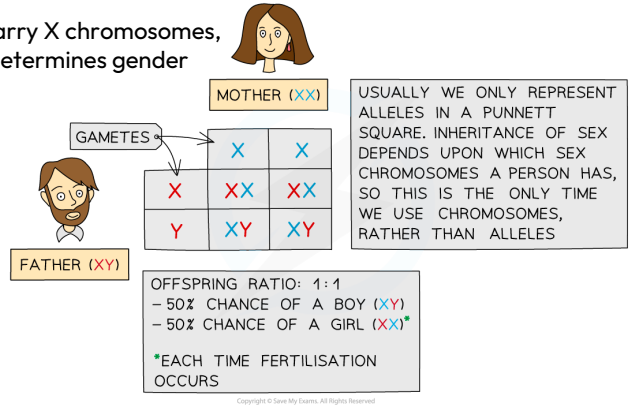
Suffers of cystic fibrosis have thick, sticky mucus that clogs the lungs and digestive system
Polydactyl is caused by a dominant allele. If you inherit the dominant allele, polydactyl will be seen in your phenotype

Suffers of polydactyl will have an extra digit (e.g. finger or toe)



7. Sex determination

Females= XX
Males= XY
All ovum carry X chromosomes, so sperm determines gender



Science - Inheritance, variation and evolution

1. Key Terms

Key Terms	Description
Evolution	The change of inherited characteristics within a population over time through natural selection, which may result in the formation of a new species
Natural selection	The natural process whereby the best-adapted individuals survive longer, have more offspring. Referred to as survival of the fittest
Variation	Difference between individuals, distance from the norm
Amber	Hardened tree resin
Extinction	No remaining individuals of a species alive

2. Variation

Variation is defined as differences between individuals of the same species

It can be:

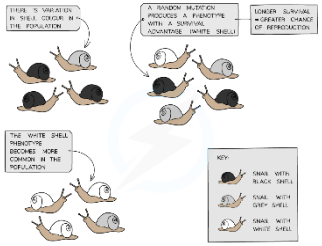
- Genetic
- Environmental
- Both

3. Evolution

Evolution is a change in the inherited characteristics of a population over time.

Happens by natural selection (Charles Darwin):

- Mutations cause a change to a phenotype
- This change makes the individual better adapted to the conditions
- The individuals survives and reproduces
- They pass on the gene for the beneficial phenotype
- Occurs over many generations



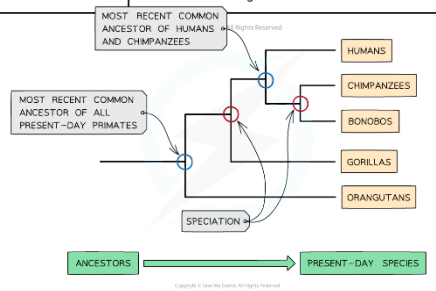
4. Fossils

Provide evidence for evolution

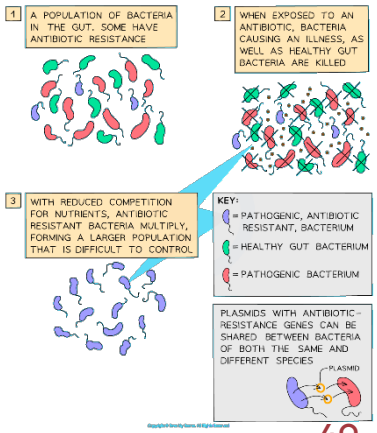
Many gaps in the early record as soft bodied organisms would decay before preservation

Fossilisation process	Explanation
From parts of organisms that have **not decayed** because one or more of the **conditions needed for decay are absent.**	• In amber (fossilised tree resin) and tar pits a **lack of oxygen and moisture** means that decomposers cannot survive there to break down dead organisms. • In glaciers and permafrost regions (areas that continuously remain frozen) it is **too cold for decomposers** to survive. • Peat bogs are **too acidic for decomposers** to survive.
When parts of the organism are **replaced by minerals** as they decay.	• Body parts such as **teeth, shells and bones** don't decay easily and can last a long time after the organism has died. • They are slowly replaced by **minerals** that form a rock-like substance in the same shape as the original body part. • They can often be seen distinctly within the surrounding rock.
As **preserved traces** of organisms, such as footprints, burrows and rootlet traces.	• An impression (eg. from footprints) can be left in a **soft material like clay.** • The impression becomes fixed as the clay **hardens.** • Sometimes an organism may be buried in clay but decays after the clay has hardened, leaving a **cast** of the organism.

Evolutionary trees show relationship between species over evolutionary time



5. Antibiotic resistance

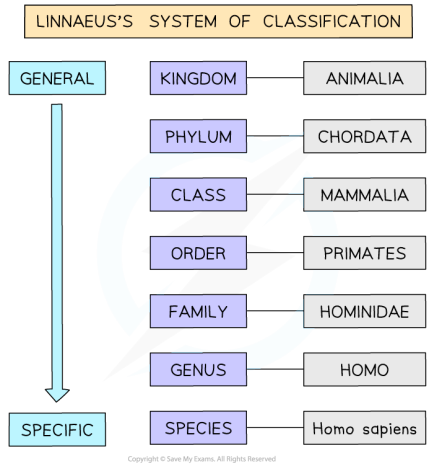


6. Classification

A species can interbreed to produce fertile offspring.

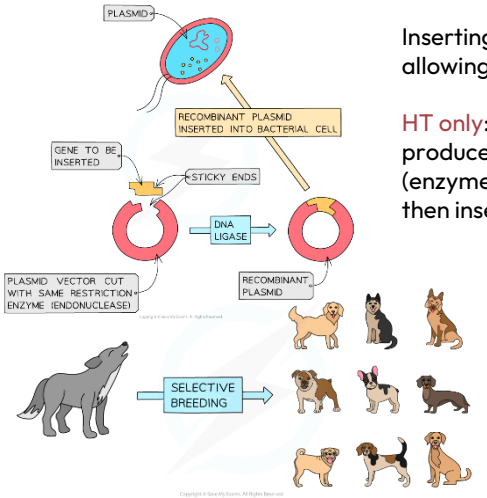
Classified based on characteristics that they share (Linnaeus).

All organisms given a binomial name (Genus and species).



DNA sequencing and microscope development allowed to see internal structures that allowed us to classify organisms more accurately, and introduced the three domains (Archea, Bacteria and Eukaryota)

7. Genetic engineering and selective breeding



Inserting desired genes into bacteria and allowing them to reproduce.

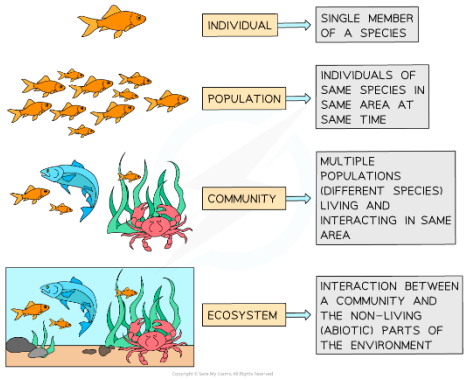
HT only: used to make bacteria that produce insulin for treating diabetes (enzymes isolate the required gene which is then inserted into the plasmid of bacteria).

Breeding together individuals with a desired characteristics over many generations.

Can result in inbreeding.

Science - Ecology

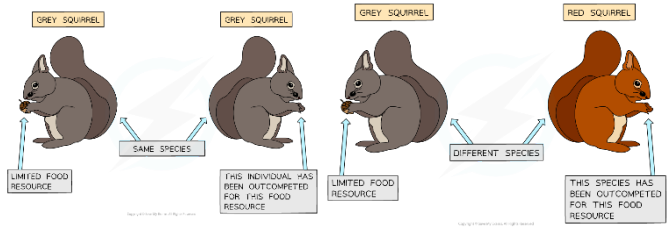
1. Key Terms	Description
Adaptation	A feature which allows an organism to survive and reproduce
Interdependence	If the population of one organism rises or falls, then this can affect the rest of the ecosystem.
Abiotic	Non-living elements of an ecosystem, such as climate, temperature, water, and soil type.
Biotic	Living elements of an ecosystem, such as plants and animals.
Community	All the organisms that live in a habitat (plants and animals).
Ecosystem	The living organisms in a particular area, together with the non-living components of the environment.
Habitat	The place where an organism lives
Adaptation	A feature which allows an organism to survive and reproduce



2. Competition

If a group of organisms all need the same resource in order to survive and reproduce (have offspring) but there is a limited amount of the resource available, they are said to compete for the resource

Competition can be between members of the same species (intraspecific competition) or between members of different species (interspecific competition)



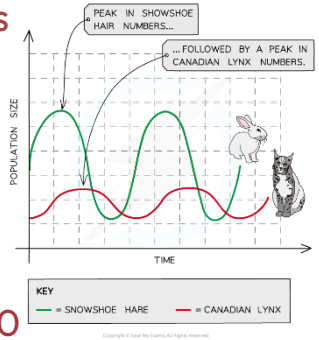
3. Biotic and Abiotic Factors

- Abiotic- Non-living factors
- Light intensity
- Temperature
- Moisture levels
- Soil pH and mineral content
- Wind intensity
- Carbon dioxide levels (plants)
- Oxygen levels (aquatic animals)

- Biotic- Living factors
- Food availability
- New predators
- New pathogens/diseases
- Competition

4. Predator- Prey Relationships

1. The number of predators increases as there is more prey available
2. The number of prey then decreases as there are now more predators
3. The number of predators decreases as there is now less prey available
4. The number of prey increases as there are now fewer predators

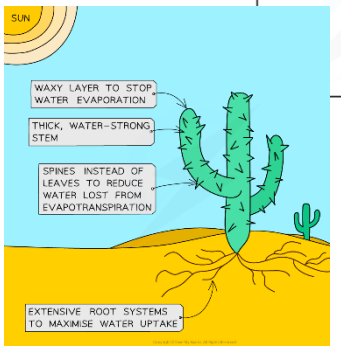


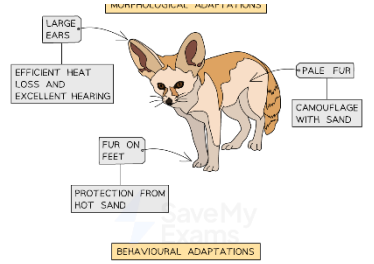
5. Adaption

Plants compete for:
- Water
- Space
- Minerals
- Sunlight

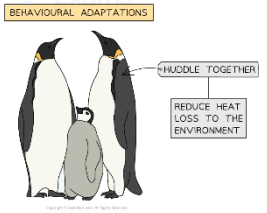
Animals compete for:
- Food
- Water
- Mates
- Territory

TYPE OF ADAPTATION	DESCRIPTION	EXAMPLES
STRUCTURAL	A PHYSICAL PART OR FEATURE OF AN ORGANISMS	1. THE WHITE FUR OF A POLAR BEAR PROVIDES CAMOUFLAGE IN THE SNOW SO IT HAS LESS CHANCE OF BEING DETECTED BY PREY 2. SEALS HAVE A THICK LAYER OF FAT (BLUBBER) TO INSULATE THEM AGAINST THE COLD CONDITIONS THEY LIVE IN
BEHAVIOURAL	THE WAY AN ORGANISM BEHAVES	1. COLD-BLOODED REPTILES BASK IN THE SUN TO ABSORB HEAT 2. RABBITS DIG BURROWS IN WHICH TO LIVE AND RAISE OFFSPRING
FUNCTIONAL	BIOLOGICAL PROCESSES WITHIN THE ORGANISM	1. SNAKES PRODUCE VENOM TO KILL PREY 2. MOSQUITOS PRODUCE CHEMICALS THAT STOP THE ANIMAL'S BLOOD CLOTTING WHEN THEY BITE, SO THAT THEY CAN FEED MORE EASILY





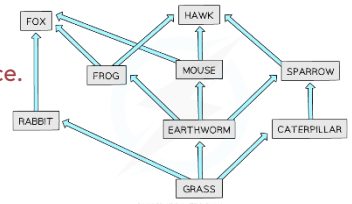
Adaptations to cold:
- Thick fur
- Blubber
- Small SA:V ratio (reduce heat loss)

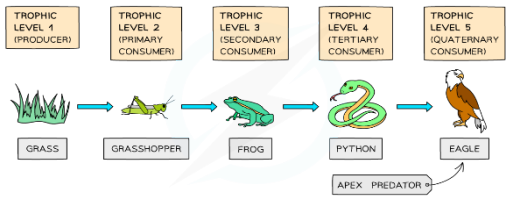


6. Interdependence

All organisms within an ecosystem rely on each other- interdependence.

The arrows in a food chain show transfer of energy.





Science - Ecology

7. Biodiversity

Variety of living organisms in an ecosystem.

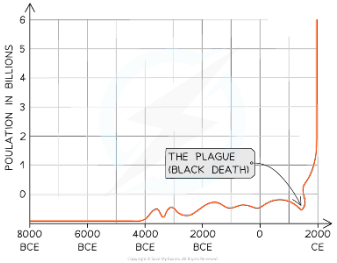
It helps to keep a stable environment.
A high biodiversity reduces organisms' dependency on each other

Human activities reduce biodiversity:

- Production of waste
- Global warming
- Deforestation

8. Waste management

Human population is growing exponentially
This means more waste and pollution are being produced which reduces biodiversity

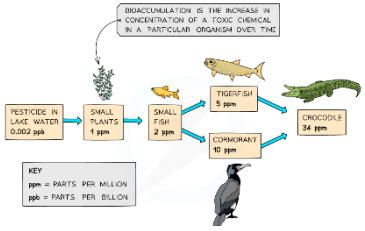


Pollution can occur in:

Land:
- Toxic chemicals (pesticides and herbicides
- Burying nuclear waste

Air:
- Smoke
- Acidic gases (form car engines contributing to acid rain)

Water:
- Sewage
- Toxic chemicals (pesticides and herbicides run off into water sources affecting plants and animals)



9. Global warming

Levels of carbon dioxide and methane in the atmosphere are increasing, contributing to global warming.

Consequences include:
- Ocean temperatures increasing, causing melting of polar ice caps / rising sea levels / flooding / coral bleaching
- Increasing temperatures causing extreme weather like super storms, flooding, droughts
- Changes in or loss of habitats due to these extreme weather events
- Decreases in biodiversity as food chains are disrupted and extinction rates increase
- Increases in migration of species to new places, including increased spread of pests and disease

10. Land use

Reason	Explanation
Clearing land for farming and housing	• Crops, livestock and homes all take up a large amount of space. • As there is an increasing population and demand for food, the amount of land available for these requirements must be increased by clearing habitats such as forests (deforestation).
Extraction of natural resources	• Natural resources such as wood, stone and metals are used to make many different products. • Many trees are cut down, destroying forest habitats • Quarrying and mining take up a large amount of space and the land must be cleared first.
Landfill sites	• Many materials cannot be recycled and are discarded when they have been used. • Landfill sites take up a lot of room and their creation often results in the destruction of natural habitats.

Peat bogs are huge carbon stores and important habitats.

They are being destroyed to produce garden compost and fuel.

This releases carbon dioxide (global warming), reduces biodiversity, is unsustainable and a non-renewable energy resource.

11. Deforestation

Effect	Consequence
Extinction / loss of biodiversity	– Forest habitats, especially tropical rainforests, have a huge range of biodiversity and as habitat is destroyed it causes the loss of large numbers of plants and animal species – Many of these species are only found in these areas and therefore will become extinct
Soil erosion	– Tree roots help to stabilise the soil, preventing it from being eroded by rain –Trees will usually take up nutrients and minerals from the soil through their roots –Without trees, nutrients and minerals will remain unused in the soil so will be washed away into rivers and lakes by rain (leaching) –This loss of soil nutrients is permanent and makes it very difficult for forest trees to regrow, even if the land is not cultivated with crop plants or grass for cattle
Flooding	– Without trees the topsoil will be loose and unstable so will be easily washed away by rain, increasing the risk of flash flooding and landslides
Increased carbon dioxide in atmosphere	– Trees carry out photosynthesis during which they take in carbon dioxide and release oxygen – The removal of significant numbers of trees means less carbon dioxide is being removed from the atmosphere (and less oxygen released) –When areas of land in forests are cleared for land use, the trees are often burned as opposed to being cut down. This releases increasing carbon dioxide levels in the atmosphere and contributing to global warming

12. Maintaining Biodiversity

Method	Impact on biodiversity
Breeding programmes for endangered species	• Breeding programmes have been set up to save endangered species from extinction. • Endangered species are bred in captivity. • Individuals can then be released back into their native habitats to help support or in some cases re-establish endangered wild populations.
Protection and regeneration of rare habitats	• Protection of vulnerable habitats such as rainforests, mangroves, heathland and coral reefs helps to preserve the biodiversity within them and stabilise these ecosystems.
Reintroduction of field margins and hedgerows in agricultural areas where farmers grow only one type of crop	• A single crop-type (known as monocultures) can only support a low level of biodiversity. • Hedgerows, as well as the wild flowers and grasses that grow when field margins are created, support a high level of biodiversity.
Reduction of deforestation and carbon dioxide emissions by some governments	• Deforestation results in habitat destruction and increased carbon dioxide in the atmosphere. • Reducing deforestation and carbon emissions will reduce the rate of current global warming, which is threatening habitats and biodiversity.
Recycling resources rather than dumping waste in landfill	• Reduces the amount of waste produced and the amount of space required for landfill sites, reducing habitat destruction. • Reduces the rate we are using up natural resources, reducing habitat-destroying activities such as quarrying and mining.

Science - Rates of reaction

1. Key Terms	Description
Activation energy	The minimum amount of energy that colliding particles must have for them to react
Catalyst	A substance that changes the rate of a chemical reaction without being changed by the reaction itself
Reaction profile	Chart showing how the energy of reactants and products changes during a reaction
Concentration	How much of a substance is dissolved in water. The higher the concentration, the more particles of the substance are present
Frequency	The total number of times an event occurs
Gradient (Higher only)	Another word for steepness. On a graph, the gradient is defined as being the change in the y value divided by the change in x value. It defines how steep a line is

2. Collision Theory

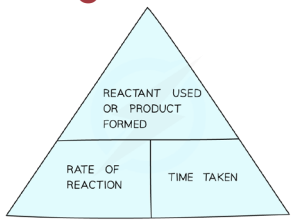
The rate of a reaction is a measure of how quickly a reactant is used up, or a product is formed.

For a chemical reaction to happen:

- reactant particles must collide with each other
- the particles must have enough energy for them to react

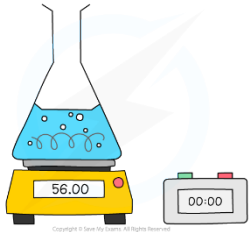
The activation energy is the minimum amount of energy needed for a collision to be successful.

3. Calculating rate of reaction

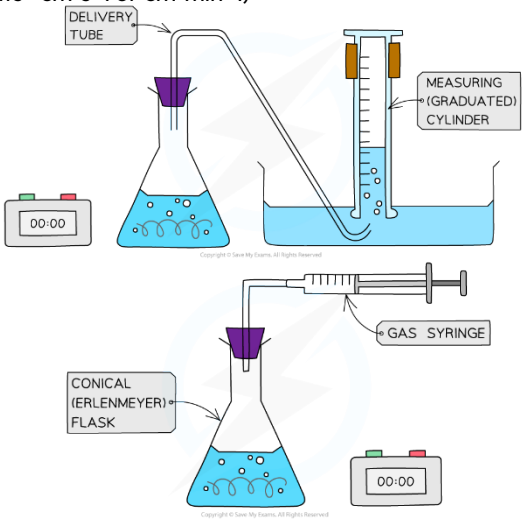


4. Measuring mass and measuring volume

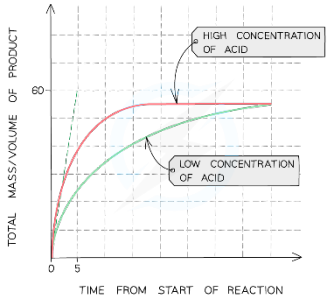
You can measure the change in mass by recording the mass at the beginning and the end of an experiment (units=g/s or g/min)



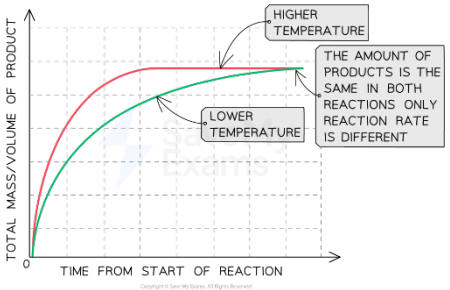
Or you can measure the change in volume by using a gas syringe or an inverted measuring cylinder (units= cm^3s-1 or cm^3min-1)



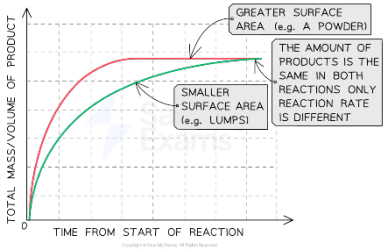
5. Rate Graphs



Increasing concentration/pressure (for gases) increases the rate of reaction because there are more particles per unit volume, so more frequent successful collisions.

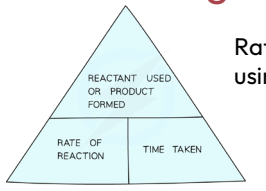


Increasing the temperature increases the rate of reaction because the particles have more kinetic energy, so will have more frequent successful collisions.



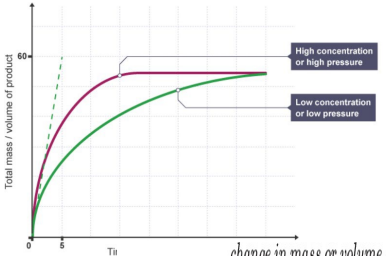
Increasing the surface area increases rate of reaction because it increases the area exposed to reactants, so there are more frequent successful collisions.

6. Rates- Higher Tier



Rates can also be calculate using moles

You can also calculate the rate by drawing a tangent to the rate curve



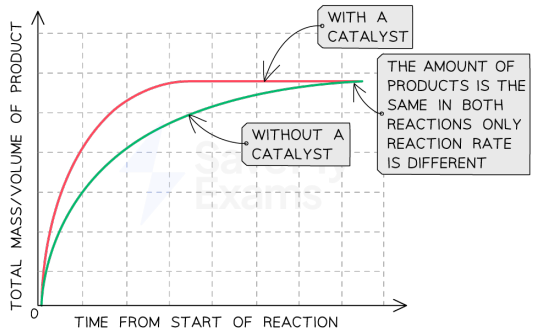
$$\text{rate of reaction} = \frac{\text{change in mass or volume of product}}{\text{change in time}}$$

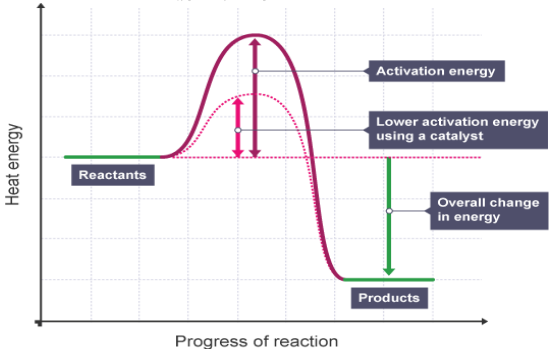
Science - Rates of reaction

7. Catalysts

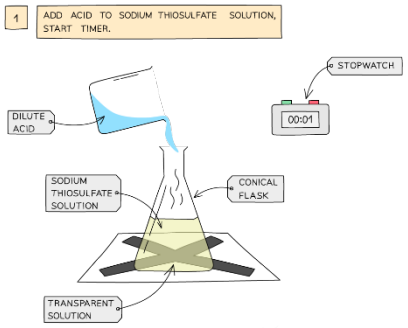
Speed up the rate of reaction without being used up

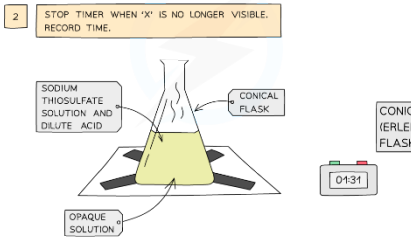
Increase the rate of reaction because they provide an alternative reaction pathway with a lower activation energy

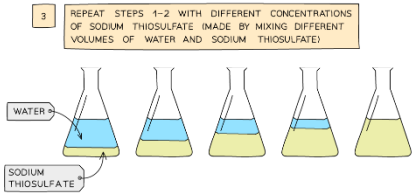




8. Required practicals

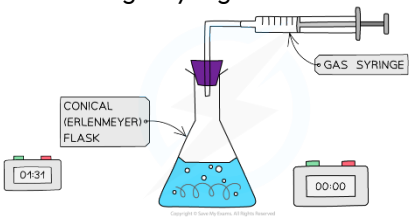






Calcium carbonate reacts with dilute hydrochloric acid: calcium carbonate + hydrochloric acid ➔ calcium chloride+ water + carbon dioxide.

The volume of carbon dioxide gas produced can be measured using a gas syringe.



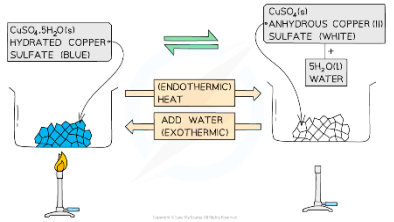
The sulfur forms a cloudy yellow-white precipitate during the reaction. The time taken for this to achieve a given cloudiness provides a way to measure the reaction.

Sodium thiosulfate + hydrochloric acid ➔ sodium chloride + water + sulfur dioxide + sulfur

9. Reversible Reactions

In reversible reactions, the product molecules can themselves react with each other or decompose and form the reactant molecules again

$$A + B \rightleftharpoons C + D$$

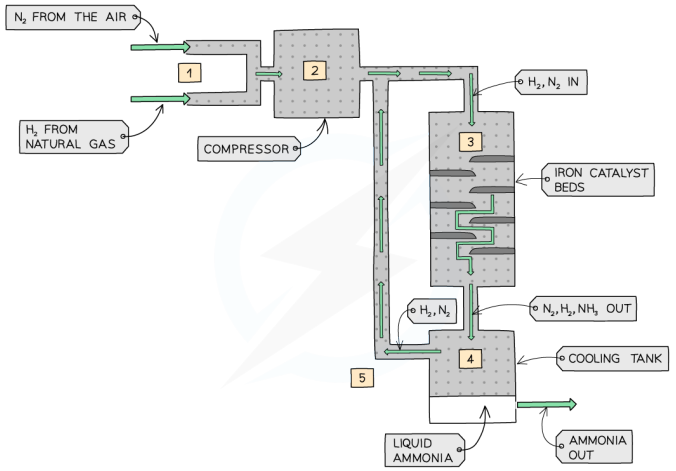


When the rate of the forward reaction equals the rate of the reverse reaction, the overall reaction is said to be in a state of Haber Process – Triple Only (in a closed system)

11. Haber Process – Triple Only

Used to make fertilisers

Is a reversible reaction



10. Le Chatelier's Principle- Higher only

This principle states that when a change is made to the conditions of a system at equilibrium, the system automatically moves to oppose the change:

- Temperature- if you decrease temperature, equilibrium will shift to favor the exothermic reaction (releasing thermal energy)
- Pressure- if you increase pressure, equilibrium will shift to the direction with fewer molecules
- Concentration- if you increase concentration of reactants, equilibrium will shift to produce more products

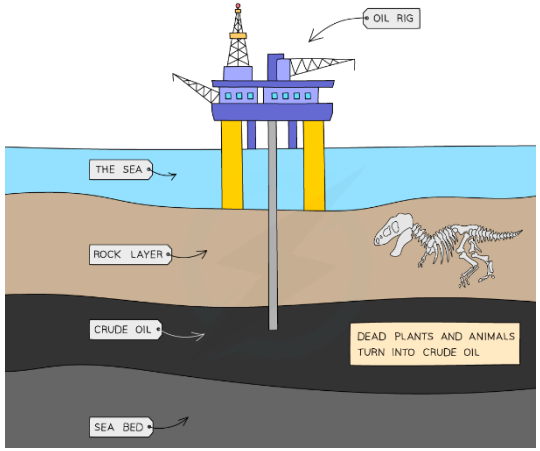
Science - Organic

1. Key Terms	Description
Crude oil	Mixture of hydrocarbons made form remains of ancient sea creatures
Hydrocarbon	Compound made of hydrogen and carbon ONLY
Alkane	Saturated hydrocarbon with the general formula C_nH_{2n+2}
Cracking	Process of breaking long chains alkanes into shorter chain alkanes and alkenes
Viscous	How thick a substance is
Flammable	How likely an object is to set on fire
Fractional distillation	Separating crude oil into different fractions using their boiling points

2. Crude oil

Crude oil is a finite resource

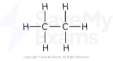
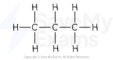
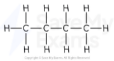
- Ancient sea creatures (mainly plankton) died and fell to the ocean floor.
- Over millions of years they were buried under sand, silt and mud. This create enormous heat and pressure which turned them into crude oil and natural gas.



3. Alkanes

- Saturated hydrocarbon
- Homologues series

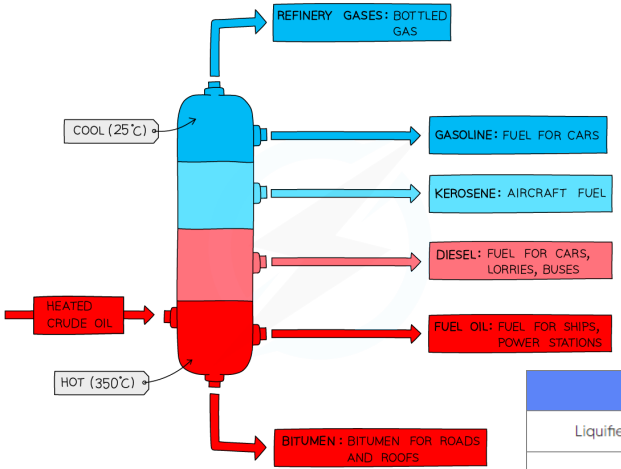
General formula for alkanes is CnH2n+2:

Displayed formula	Name	Molecular formula
	methane	CH_4
	ethane	C_2H_6
	propane	C_3H_8
	butane	C_4H_{10}

4. Preventing Corrosion

Used to separate a mixture of hydrocarbons

- Crude oil is heated and vapourised.
- It enters the column at the bottom where it is hottest .
- The gas rises up the column until it reaches its boiling point.
- It condenses at its fraction
- Longer chain molecules have higher boiling points so are collected near the bottom. They are also more viscous and less flammable.
- Shorter chain molecules have lower boiling points so are collected near the top. They are also less viscous and more flammable.



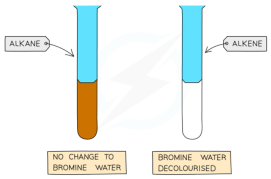
5. Cracking

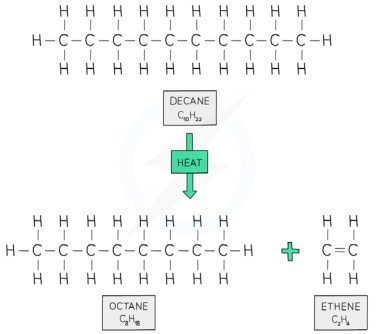
Higher demand for shorter chain alkanes because they are more flammable so make better fuels

Longer chain alkanes are cracked into shorter chain alkanes and alkenes (unsaturated hydrocarbons with a C=C)

- Catalytic cracking (heat to vaporise crude oil, pass over aluminium oxide catalyst)
- Steam cracking (heat to vaporise then mix with steam)

They can be tested for by adding bromine water





Fraction	Use
Liquified petroleum gas	Domestic heating & cooking
Petrol	Fuel for cars
Kerosene	Jet fuel
Diesel	Diesel engines
Heavy fuel oil	Ships and power stations

Science - Chemistry of the atmosphere

1. Key Terms	Description
Atmosphere	The envelope of gases which surrounds a planet
Greenhouse effect	the process through which heat is trapped near Earth's surface by substances known as greenhouse gases
Global warming	The rise in the average temperature of Earth's atmosphere and oceans
Fossil fuel	Coal, oil and natural gas. An energy-dense fuel made from the pressurized remains of ancient organisms
Incomplete combustion	Burning fuels in the presence of insufficient (not enough) oxygen
Complete combustion	Burning fuels in the presence of sufficient (enough) oxygen Fuel + oxygen -> carbon dioxide + water
Carbon footprint	The volume of carbon dioxide released into the atmosphere during the life-cycle of a product, service or event
Atmospheric pollutant	Contamination of the air by a chemical, physical or biological agent which can cause harm

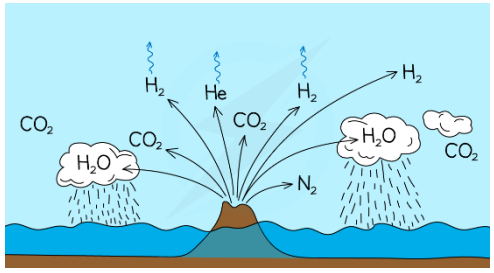
2. Global warming

Human activities release more greenhouse gases:

- Deforestation
- Burning fossil fuels
- Agriculture (farm animals)
- Landfill sites

All of these contribute to global warming and climate change.

3. Evolution of atmosphere



Earth formed 4.6 billion years ago.

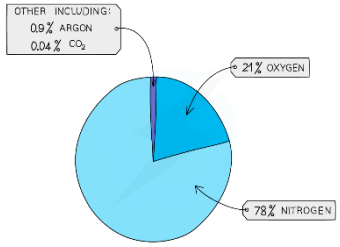
Earths early atmosphere was mainly carbon dioxide, water vapor, ammonia and methane (released by volcanos).

As Earth cooled, water vapor condensed to form oceans .

Algae evolved which could take carbon dioxide in for photosynthesis and release oxygen.

Carbon dioxide also dissolved in the oceans and was taken in for the formation of sedimentary rocks.

This is the modern day atmosphere.



4. Climate Change

Climate change is when there is a long-term shift in worldwide weather patterns and conditions

- Rising sea levels and flooding (ice caps are melting)
- Changes to rainfall (causing intense droughts or flooding)
- Frequency and severity of storms
- Extreme heat waves (changing distribution of species

5. Greenhouse effects

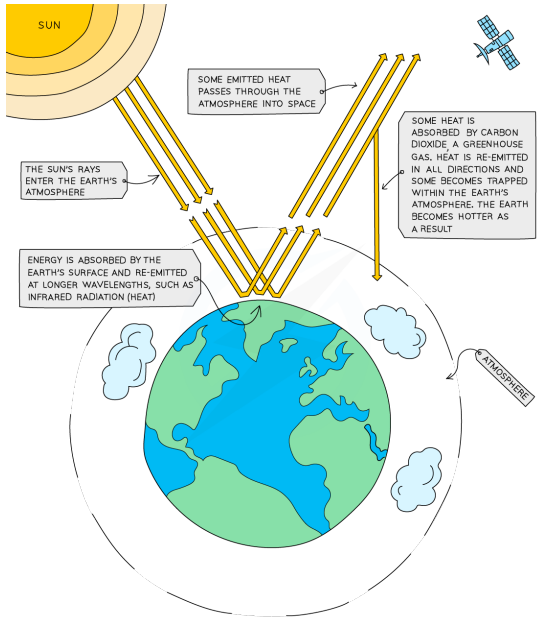
Greenhouse gases are:

- Carbon dioxide
- Water vapour
- Methane

Short wavelength radiation enters through the Earths atmosphere.

It is absorbed by Earth and remitted at a longer wavelength.

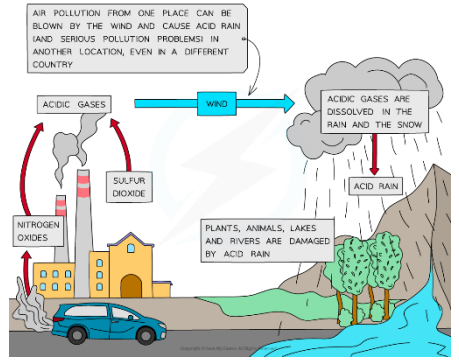
Greenhouse gases absorb longer wavelength radiation and trap it in the atmosphere, heating up Earth.



6. Air pollution

Acid rain:
Sulphur dioxide from sulphur impurities in fuels.

Nitrous oxides released from oxygen in the air reacting with nitrogen in hot car engines.

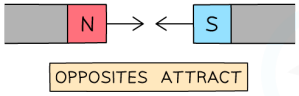


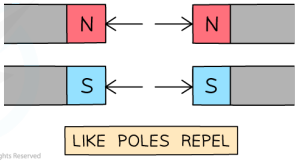
Carbon monoxide- formed from incomplete combustion of fuels and is an odourless, colourless, toxic gas
Particulate- formed from incomplete combustion of fuels and causing global dimming and respiratory problems.

Science - Magnets

1. Key Terms	Description
Magnet	An object capable of exerting a magnetic force
Induced magnet	A temporary magnet, made from a magnetic material placed in a magnetic field. The induced magnetism is lost when moved out of the magnetic field
Magnetic field	Area surrounding a magnet that can exert a force on magnetic materials
Transformer	An electrical device that increases, or decreases, the potential difference (voltage) of an alternating current
Solenoid	A straight coil of wire which can carry an electric current to create a magnetic field
Motor effect	The effect where a force is exerted on a wire carrying a current in a magnetic field

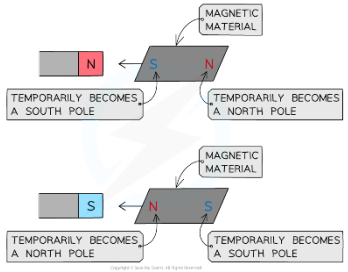
2. Magnets



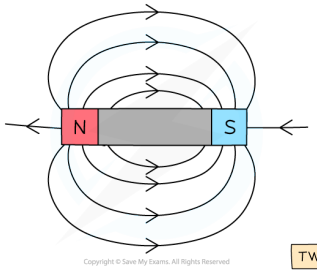


3 magnetic metals are:
- Iron
- Cobalt
- Nickel

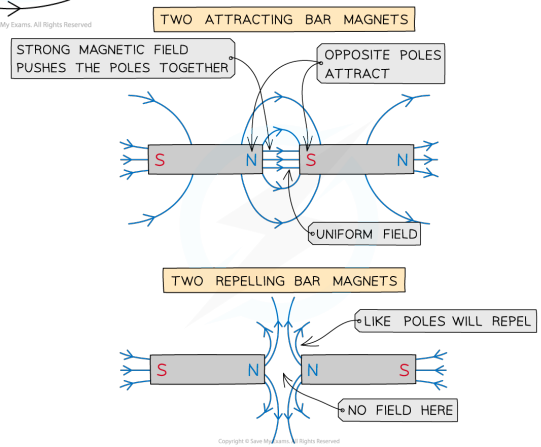
Permanent magnets always exert a magnetic field (attract and repel)
Induced magnets only become magnetic when in the magnetic field of a magnetic object (only attract, cannot repel)



3. Magnetic fields

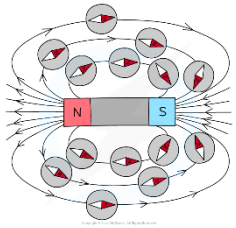


Always run North to South
Strongest at poles
NEVER overlap

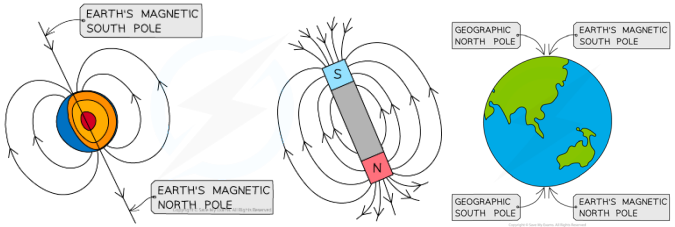


4. Magnetic fields

Can use a plotting compass or iron filings



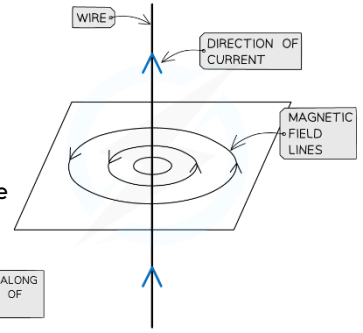
5. Earth's magnetic field

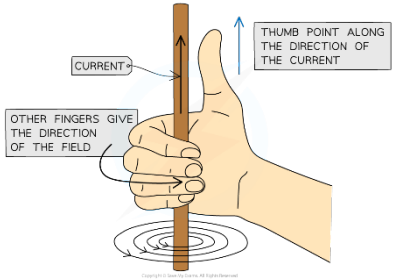


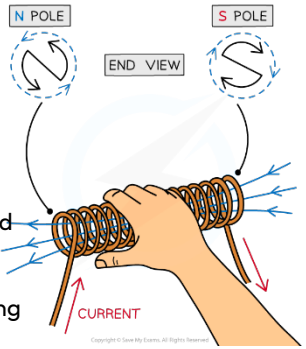
6. Electromagnets

When a current runs through a wire you get a circular magnetic field

HT only- Right-hand thumb rule



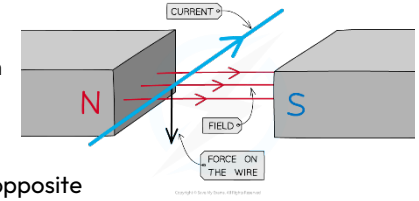


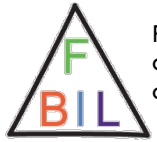


HT only- a solenoid is a coil of wire used to increase the strength of a magnetic field
You can increase the strength by adding an iron core (This is an electromagnet)

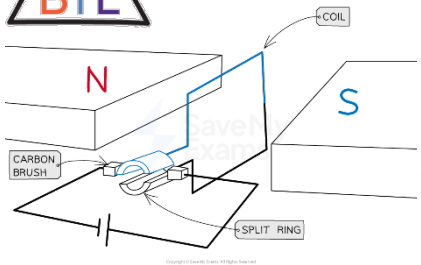
7. Motor Effect (HT only)

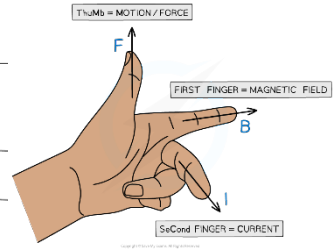
The motor effect occurs when a wire with current flowing through it is placed in a magnetic field and experiences a force





Forces acting in opposite directions on each side of the coil, causing it to rotate (electric motor)





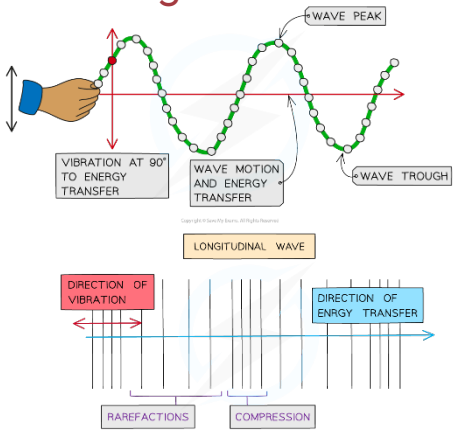
Science – Waves

1. Key Terms	Description
Oscillations	The repeated and regular fluctuations, above and below the same position
Vibrations	Repeated movements back and forth (about a fixed point)
Longitudinal wave	A wave that moves in the same direction as the direction in which the particles are vibrating
Transverse wave	A wave that moves in a direction at right angles to the way in which the particles are vibrating

2. Transverse and Longitudinal

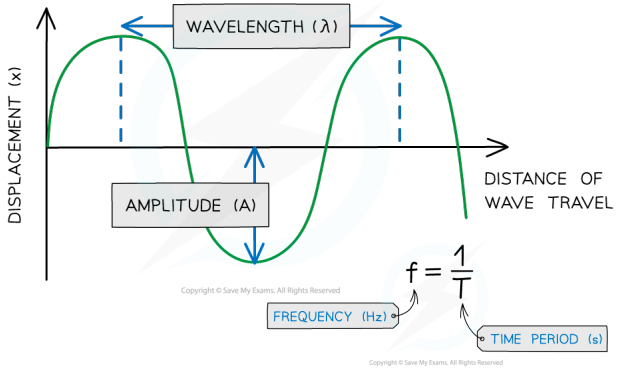
Transverse- energy transfer is perpendicular to direction of travel.

Longitudinal- energy transfer is parallel to direction of travel.

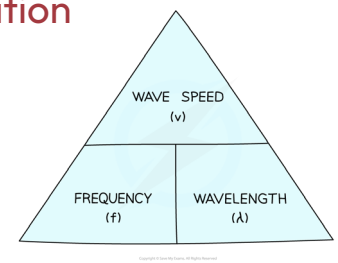


Property	Transverse waves	Longitudinal waves
Structure	Peaks and Troughs	Compressions and Rarefactions
Vibration	90 degrees to direction of energy transfer	Parallel to direction of energy transfer
Vacuum	Only electromagnetic waves can travel in vacuum	Cannot travel in a vacuum
Material	Can move in solids, liquids and gases	Can move in solids, liquids and gases
Density	Constant density	Changes in density
Pressure	Pressure is constant	Changes in pressure
Speed of wave	Dependant on material it is travelling in	Dependant on material it is travelling in

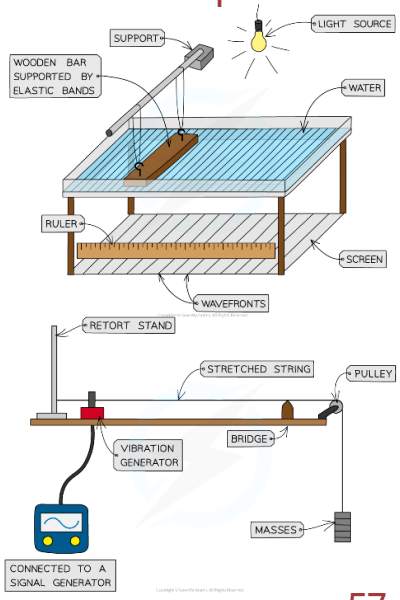
3. Describing Waves



4. Wave equation



5. Wave equation

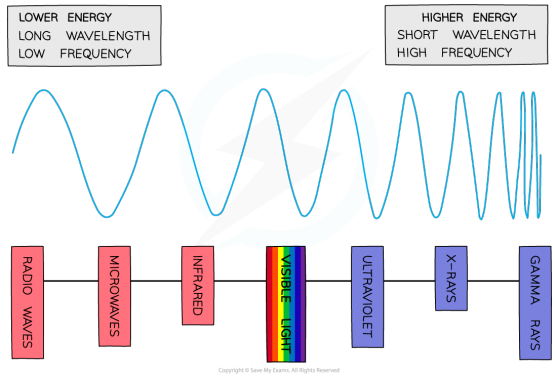


Waves in a liquid
You can measure:
- Wavelength
- Frequency

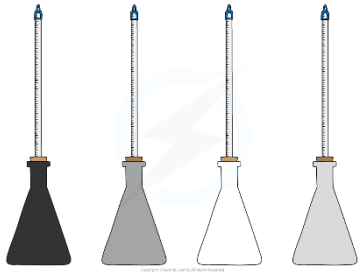
And use the equation to calculate wave speed.
You can measure:
- Wavelength
- Frequency (on generator)

And use the equation to calculate wave speed.

6. EM Spectrum

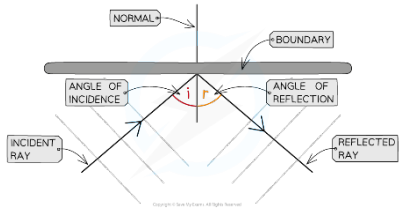


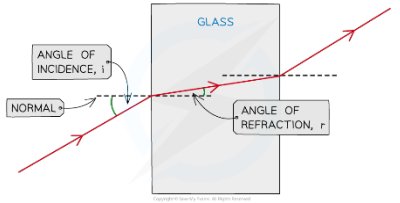
7. Infrared Required Practical



Colour	Good or bad emitter?
Black	Good (cools fastest)
Dull grey	Reasonable (second fastest)
White	Poor (second slowest)
Silver	Very poor (cools slowest)

8. Reflection and Refraction (HT Only)





Light travels in straight lines and can be reflected.

A wave can change speed at a boundary if its hits it at an angle because the materials will have different densities (causing the wave to speed up or slow down).

Art

Exam Paper out February 2025

Choose your Question.
There are 7 questions. Each question has between 5-7 artists, craftspeople or designers. Choose a question that interests you.

Artist Research.
There will be 5-7 named artists, craftspeople or designers in the question. Look at the work of all and choose 3-4, print one image from each and write your opinion about their work.

Brainstorm.
Choose a question and create a brainstorm across a double page. This can include images and drawings. The more detailed you make this the more refined your idea will be.

Resource Material.
Collect resource materials that link to your brainstorm. This can be collaged images and information from newspapers and magazine, photographs and drawings. It should be a mixture of all of these and it should be annotated telling me why you have chosen this and how it relates to the question.

Completion of Resource material and initial idea development.

Second Brainstorm
Select a word or phrase from the first brainstorm. This is the area that you want to explore, to develop your ideas. This will be the real starting point for your PPE.

More resource materials that link to your second brainstorm. This can be collaged images and information from newspapers and magazine, photographs and drawings. It should be a mixture of all of these and it should be annotated telling me why you have chosen this and how it relates to the question.

Development of Ideas
Start to develop your ideas by doing drawings from your resource materials. These drawings should be considered and you might start to experiment with different materials and techniques. The more ideas the more marks!

Artist Research x3
You will have some ideas and now need to find your own artists that link to your work. Do a double page spread on them. Write and tell me why you have selected them and how they relate to your work.

Contextualisation.
What will be the meaning, message or idea behind your idea?

More Idea development
You will draw ideas inspired by your resource materials and the artists that you have made links with.

Experimentation of Materials.
You will have started this when you initially recorded your ideas, however you should be ready to select one idea, draw it onto A4, split in half and experiment with two different materials such as acrylic and watercolour. Write and say which you prefer and why. How does it relate to your artist?If you are doing 3D you will create small versions of the ceramic piece or samples of the textile piece.

Final Composition / Idea.
You will know from your idea development what you want to do as the final outcome / piece. If it is a painting draw the final composition onto A3 and paint it as a mini version of what you will do in the exam. If it is 3D make a smaller model. You are showing the examiner your intentions.

Final Idea. 1.4.25

Art Exam 29th April & 1st May 2025

Creative media production – Component 3 – Externally assessed exam

1. What are the different types of creative media products?

Audio / Moving image	• TV progammes • Films • Music videos • Animations • TV and radio adverts • Podcasts
Publishing products	• Newspapers • Magazines • Comics • Brochures • Print advertisements
Interactive media products	• Websites • Mobile apps • E-magazines • Mobile games • Online games • Video games • Advertisements

2. How can you identify the audience for a media product?

Gender	Is it aimed more at a male or female audience? Or both?
Age	Is it aimed at a particular age group? E.g. Children/Teenagers
Lifestyle	Is it for a specific group with a shared interest? E.g. exetreme sports, knitting, cars.
Socio-Economic	Is it aimed at a particular class of people? E.g. upper class – Tatler magazine
Primary audience	Who is the product mainly aimed at?
Secondary audience	Who else might be interested in the product or be attracted to it?

3. What are the purposes of different media products?

To inform the audience
To inspire the audience
To entertain the audience
To benefit the audience
To raise awareness for a cause
To promote a product / service / person
To innovate
To provide escapism
For the benefit of the community
For profit
For experimentation

4. What is meant by codes and conventions?

The features of media products are common to most similar products.
For example – most magazine covers feature: A title, a larger central image, information about the articles in the magazine, the price, a barcode etc

Creative media production – Component 3

5. How are media products designed to appeal to the audiences?

Genre	The recognisable type / style of a product • For film this includes: Sci-Fi horror, thriller, comedy, animation. • For games: 1st person shooter, Driving, Sports, PVP, strategy
Sub-genre	• Different versions within a genre – perhaps combining two genres to make a new one (Hybrids). E.g. Animated Sci-fi, first person driving game
Repetition / difference	• How similar / different is the magazine, TV programme, website, game to other similar products in the same genre

6. Representation of people and places: How does the media product portray people and places?

Are there positive or negative portrayals of the characters and places?
Are there stereotypical images / descriptions?
Does the producer consider the perspective of the audience?

7. Audience interpretation: How does that media product portray people and places?

1. Passive interaction: questioning the message without question
2. Active interaction: questioning the message given or using interactive features (e.g. the Red Button, voting on celebrity shows like "I'm a celebrity"
3. Preferred reading: where the producer wants to give a particular message or point of view.

8. Narrative: What are the different ways that media producers develop the story?

Storytelling	E.g. the plot of a film or the use of images alongside text in an app, the inverted pyramid of a newspaper article
Narrative structure	Does the story have a linear structure? (Start, middle, end) or a non-linear structure, is it interactive? Is the storyline circular?
Point of view (POV)	From whose point of view is the story told / experienced? 3rd person? 1st person?
Characterisation	This helps in creating a picture of the protagonist and others, in the reader's mind. It talks about the characters – Persona, looks, mannerisms, language, type of person, background etc.
Themes	Does the product have an identifiable theme? E.g. Post-apocalyptic, romance, zombie invasion, western, detective etc
Setting	Where is the product based – this could be the location or background or in games it could be open-world
Mode of address	There are different ways to address the audience: formal (e.g. a news broadcast) direct (e.g. the cover of a magazine) or informal (e.g. a game)

Creative media production – Component 3

9. Media production techniques

How are media production techniques combined to create meaning for audiences?

Audio/moving image media products:

- Camera work, e.g. set-up, framing, shot type/length, camera angle, movement of the camera in a shot
- Mise en scene, e.g. use of costume, hair, makeup, props, setting and expression
- Lighting set-up, e.g. under, overhead lighting, side lighting, fill, use of shadows
- Use of sound, e.g. sound effects, voice-overs, dialogue, incidental music, bridges, sound mixing
- Editing techniques, e.g. flashbacks, transitions, pace, continuity, montage

Publishing media products:

- Using different layouts and design techniques, e.g. alignment balance, contrast, proximity, repetition, rule of odds, use of white space
- Style of typography, e.g. serif and sans serif typefaces, fonts, and font size, letter spacing, and line height, readability
- Photographic techniques, e.g. composition, image quality, lighting effects, depth of field, aesthetic, rule of thirds
- Image editing techniques, e.g. adding filters, colour and contrast, layering images, distorting images

Interactive media products:

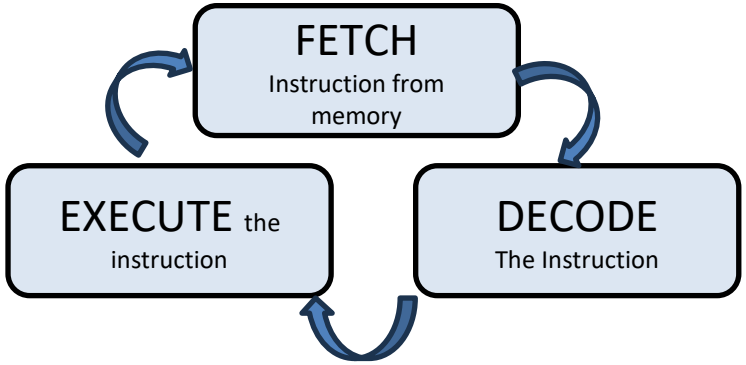
- Interactive features, e.g. image galleries, option menus, navigation screens, levels
- User interface, e.g. screen, interaction, graphics, buttons, layout, colour
- Usability/playability e.g. accessibility, navigation, controls, rules, challenge
- Mise en scene and lighting, e.g. graphics, sprites, character models, 3D environments, interactive objects, textures, lighting schemes
- Sound design, e.g. soundtracks, sound effects, sounds triggered by game events

Computer Science – Review and revise

1. Computer hardware

Von Neumann Architecture:

Program instructions and data are both stored in memory. Instructions are retrieved and executed by the CPU using the Fetch-Decode-Execute Cycle.



CPU : Central Processing Unit:
ALU : Arithmetic Logic Unit
CU : Control Unit

Clock: Clock speed: Processing cycle per second

CPU Registers (very fast memory)

- Program Counter (PC)
- Memory Address Register (MAR)
- Memory Data Register (MDR)
- Current Instruction Register (CIR)
- Accumulator (holds result from ALU)

Embedded Systems

A computer system dedicated to a specific task and built into an electronic device e.g.: Sat Nav, microwave, burglar alarm, camera

2. Memory & storage

Random Access Memory (RAM)

is the main working memory of the computer
The computer stores the instructions for the operating system and all running programs and data in RAM when your computer is turned on.
RAM is volatile so it empties when the computer is turned off or power is cut

Read Only Memory (ROM)

Contains the initial instructions for the computer when it is turned on. ROM is non-volatile so it is not lost when the power is off.

Virtual Memory:

Part of the Hard Drive is reserved to be used as an extension to the RAM. Instructions and data are swapped between RAM and VM although they can only be executed when in RAM.

Secondary Storage:

Optical - (CD, DVD, Blu Ray) - Lasers read & write using light.
Magnetic: (Hard Disk Drive, tape) Mechanical parts move over the disks surface to read and write data magnetically.
Solid State Drive (SSD, USB, Flash) Data is recorded onto solid memory chips without any moving parts

3. Key words

Central Processing Unit The "brains" of the computer	**Secondary Storage** Optical, Magnetic SSD	**Denary** Normal numbering system, base 10, 0 to 9	**Algorithmic thinking** Thinking logically to solve a problem using code
Registers small areas of memory on the CPU, store data or instruction, fast.	**Virtual memory** When the CPU borrows memory from RAM	**Hexadecimal** Base 16 uses 0 to 9 then A B C D E F	**Decomposition** Breaking down a problem into easy to solve parts
Cores Some computers have multiple CPUs or cores = more instructions processed	**Cache** Frequently used data / instructions are stored in cache Accessed much faster than RAM	**Character set** Letters, numbers and characters stored as binary. ASCII and Unicode	**Abstraction** Removing unnecessary detail to make a problem easier to solve
Clock Speed The speed instructions are executed	**FDE Cycle** Instructions are Fetched, Decoded then executed in the CPU	**Digital Images and sound** storing analogue using binary numbers	**Iteration** looping or repeating a section of code. While loop or For loop
Primary Storage RAM – Volatile, changeable ROM – Non-volatile	**Binary** The number system used by the CPU, Base 2 only use 1 and 0	**Selection** Using IF change the route through the code depending on variables	**Data Types** Integer: whole number String: letters & number Boolean: True/False

Computer Science

1. Converting between Number bases

Binary (base 2)

128	64	32	16	8	4	2	1
0	0	1	0	1	0	0	1

32 + 8 + 1 = 41
Convert to Denary - Add all the place values where there is a 1 below.

Hexadecimal (base 16)

16	1
B	4

B = 11 so 11 * 16 = 176
+
1 * 4 = 4
So B4 = 180 in HEX

Hex	Dec
A	10
B	11
C	12
D	13
E	14
F	15

HEX is used because it is shorter than writing binary. Used in colour selection:
#A1 4F 9C is lilac
#FF 00 00 is red

Alternate method convert to binary first

B=11					4			
8	4	2	1		8	4	2	1
1	0	1	1		0	1	0	0

1: Split and convert nibbles to binary

128	64	32	16	8	4	2	1
1	0	1	1	0	1	0	0

2: Join and convert binary to denary

128+32+16+4 = 180 HEX

2. Adding, multiplying and dividing Binary

Adding binary

1+0 = 0
1+1 = 10
1+1+1=111

Carry the extra digits !

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

Check your answers by converting to Denary!

Underflow error (numbers fall off the right) reduces accuracy.
Overflow error (numbers fall off the left) error in answer.

Using Binary shift

Left shift = multiply (by 2 each place)
Right shift = divide (by 2 each place)

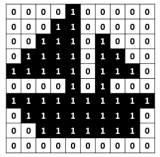
110 = 6

Shift one place left = 1100 = 12
Shift two places left = 11000 = 24
Shift one place right = 11 = 3

Negative numbers: Most significant bit indicates if the number is negative

3. Images and Sound

Images: Stored in binary
Metadata – data about the image (e.g. size, location, file type)
Pixel – smallest picture element
Colour Depth / Bit Depth – number of bits to store each colour
Resolution – pixels per inch
Bitmap images – use a single bit (2 colours)
Vector images – shapes are stored as vectors



Sound: stored in binary
Sample rate – samples of analogue per second
Bit depth – the number of bits storing each sample
More samples = better representation = bigger file

Calculate from bits = 2n so 3 bits = 23 = 2*2*2 = 8 possible colours

Units of measurement	
Bit	1 or 0
Nibble	4 bits
Byte	8 bits
Kilobyte	1 thousand bytes
Megabyte	1 million bytes
Gigabyte	1 billion bytes
Terabyte	1 trillion bytes
Petabyte	1 Quadrillion bytes

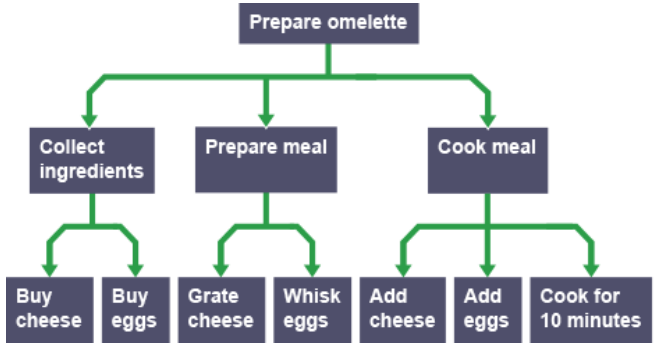
Computer Science

1. Computational Thinking

Abstraction	Converting a real world problem into the inputs, processes and outputs needed to solve it. Simplifying and removing unnecessary detail.
Decomposition	Breaking a problem into sub-problems to make the task more manageable or to share tasks.
Algorithmic thinking	Identifying the steps to solve a problem in the right sequence.
Pseudocode	Not an actual programming language. Instead, it is a simple way of describing a set of instructions in a manner that resembles a programming language.

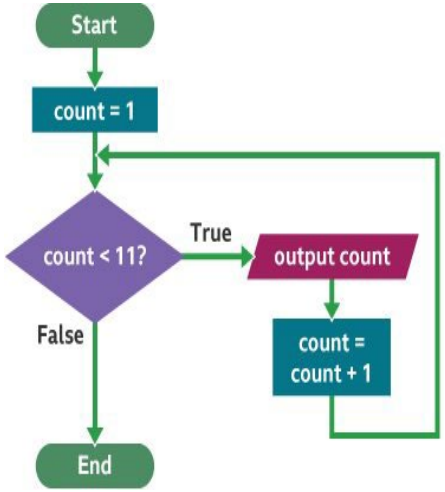
2. Structure diagram

Break down the problem into smaller sections. These smaller sections can then be worked on one at a time.
Links to Decomposition



3. Flow Diagram

Break down the problem into the inputs, processes, decisions and outputs needed to solve a problem. Links to Abstraction.



4. Test data

Check	Example
Range check	A number or date is within a sensible/allowed range
Type check	Data is of the right type, such as integer, letter or text
Length check	Text entered is not too long or too short – for example, a password
Presence check	Checks that data has been entered, i.e. the field has not been left blank
Format check	Checks that the format of, for example, a postcode or email
Check	Example

Maintainability
Ways to make your code more maintainable: • Using Sub Programs • Naming conventions • Indentation • Commenting

Computer Science

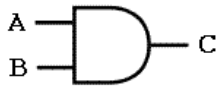
1. Boolean Logic

Logic Diagrams

Boolean Operators

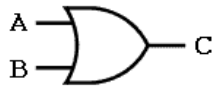
AND, OR, NOT Truth Tables

AND



Inputs		Output
A	B	C
0	0	0
0	1	0
1	0	0
1	1	1

OR



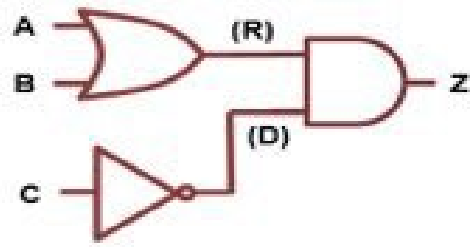
Inputs		Output
A	B	C
0	0	0
0	1	1
1	0	1
1	1	1

NOT

Input	Output
A	C
0	1
1	0

Logic Expressions

Z = (A OR B) AND (NOT C)



A	B	C	(R)	(D)	Z
0	0	0	0	1	0
0	0	1	0	0	0
0	1	0	1	1	1
0	1	1	1	0	0
1	0	0	1	1	1
1	0	1	1	0	0
1	1	0	1	1	1
1	1	1	1	0	0

2. Languages

Low level languages:

- Machine Code 101011 001001
- Assembly Language LDA 51

High level languages: (Python, Scratch, C#)

- Source code total = qty * val

Compiler translates program to object code

Interpreter translates and executes line by line

IDE

Integrated development environment (IDE) is used because:

- Source code editor.
- Error debugger.
- Run time environment.
- Translator (compiler or interpreter).
- Automation tools

Utility Software

Type	Description
encryption	Makes files unreadable without the encryption key
defragmentation	Reorders files stored on hard disk to free up space
compression	Reduce file size: Lossy or Lossless
Back-up	Create a copy of files for security

Operating System

Functions of operating systems

providing a user interface managing processes	managing input and output devices managing applications	managing security managing the computer's memory

Computer Science – Review and revise

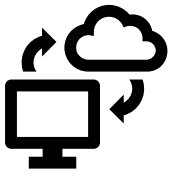
1. Social, Environmental, Cultural and legal implications of technology

Ethical issues

What is morally right / wrong not just what is possible
Equality of access to technology
Ensuring public safety
Ensuring data is only seen by those who should see it

Legal issues

Intellectual Property, Copyright & Software Licences
Opensource vs Proprietary software
Computer Crimes



- The Data Protection Act 1998/2018
- The Computer Misuse Act 1990
- The Copyright, designs and Patents Act 1998
- Creative Commons License
- The Freedom of Information Act 2000

Cultural issues

Changes to the way we live, work, shop, communicate, socialise, etc.
Wearables / the Internet of things
High street vs online retailing
Social media (benefits/risks, digital divide)
Robots / AI - how will they affect people's lives?

Example Questions & structure

A coach offers an elite athlete 'supplements' that cannot be detected in drug tests and can enhance performance. Is it fair to take them?	Does the athlete really know what they are taking? How are non-detectable 'supplements' different from drugs or just a good diet? Is it fair to engage in something that is not available to other athletes? Is it an unfair advantage?
AI software has been introduced which helps a hospital select who receives organ transplants. Discuss the Cultural, legal and ethical implications	Should we consider age and current health? Should we consider what individuals are currently contributing to society? Would wages be considered? What Laws might be linked to the software and its use?

Privacy issues

Personal / Sensitive Data
Data mining, Content Networks & Advertising.
Digital Footprint

Environmental issues

Fossil fuels in computer manufacturing
Landfill / Toxic waste
Power consumption (2% by Data Centres)
Recycling & Recycling Process (Exposure

How to succeed with Essay-style questions:

- Use punctuation
- Make a logical argument
- Marks are gained for clarity
- Show what you know – include tier-3 vocab

Answer the question!!

Design Technology - Industry and Enterprise

1. Automation

This is when machines and robotics help make products or make them for you.
Often this is done by CAD (Computer Aided Design) and CAM (Computer Aided Manufacture)
This helps products be made quicker, with more accuracy. Reducing errors humans make to products.
However, these machines are expensive to buy, need specialist training to use and need constant maintenance to keep them working properly

2. Virtual Marketing

This is when websites, social media and email are used to promote and sell products. This has become very popular in recent years, with big social media apps being funded by advertisers
Companies can also pay search engines to push their company further to the top of the results page, so customers are more likely to click it.

3. Cooperatives

A Cooperative is an Enterprise that is run by members that are part of the workforce or customers.
This means the organisation is democratic and often supports the local community.
They are set-up to protect the rights of their members and ensure the same rules apply to everyone

4. Enterprise

This is when an idea is developed into a business and produces a viable product.
Often, one of the biggest enterprises in in apps for smartphones
To make sure ideas are protected from being copied, a **Patent**can be applied for.
This legally protects your idea on invention from being stolen.

5. Crowdfunding

This is where ideas are funded by large groups of ordinary people.

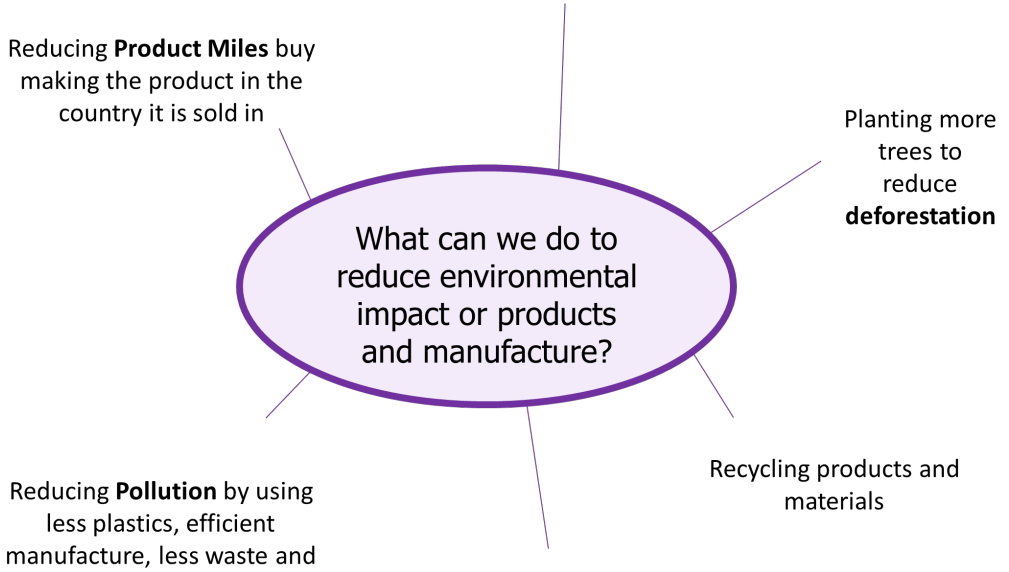
www.kickstarter.com is a good example of this.

6. Fair Trade

This is an organisation that promotes fair pay, working conditions and better trade with farmers in developing countries
You can tell when something is Fairtrade as it will often have the symbol on the product or packaging. Common Fairtrade items include; bananas, cotton and chocolate.

Design Technology - Environment

1. The 6Rs	Meaning
Reuse	To use a product again either for the same purpose or a different one
Reduce	To have less of material/packaging/pollution when making products by making them more efficient
Recycle	Breaking down and forming the material into another product
Refuse	Customers not buying or supporting products that make an environmental impact
Rethink	Designers and customer rethinking their decisions when making and buying products.
Repair	Fixing a product rather than throwing it away. Extending its life rather than using more resources to make another. Often products are Designed for Maintenance so can easily be repaired. E.g. Using screws so even non-specialists can take a product apart, or using components that can easily be replaced like fuses or batteries



2. Life Cycle Assessment

This is when a designer looks at the environmental impact a product makes over its life time and how it could be reduced. Including:

- Impact of materials
- Impact of processes
- Product Miles (how far a product has to travel to get from factory to consumer)
- Impact while in use
- Impact when disposed of (6Rs)

3 .Sustainability

Sustainability is maintaining our planet and its resources and making a minimal negative impact

Finite Resources

Will run out of eventually

Plastics

Metals

Polymers (Textiles)

Infinite Resources

Can be re-grown and re-bread. Will not run out of

Paper

Boards

Natural Timbers

Cotton

Leather

4. Planned Obsolescence

This is where products “die” after a certain amount of time. E.g. Disposable cups, Phones, Lightbulbs, Printer Ink, etc. This can have a big environmental impact as customers are throwing away lots of products, and resources

Design Technology - Energy Generation and Storage

1. Key Words

Non-Renewable Energy Sources	This is when certain sources of energy will run out eventually
Fossil Fuels	• Coal, Oil and Gas • Burned to create steam, turned in turbines to create electricity. • Burning creates C02 which adds to • Global Warming
Nuclear Power	• Nuclear Fission controls the reactor (that createsthe electricity). This requires Uranium which is non-renewable • Accidents and waste can severely damage the environment and cause radiation poisoning • Radiation poisoning can be fatal and cause physical deformations • Nuclear waste has to be disposed of properly and is hazardous for thousands
Renewable Energy Sources	This is when certain sources of energy will not run out.
Solar	• Solar panels are used to collect light and convert it into electricity • There is no waste and a consistent supply • However, the panels are not effective at night or in countries where there isn't a lot of sunlight
Wind	• Turbines harness wind energy • Not effective on non windy days • Some people don't like turbines as they are noisy, and not attractive to look at
Hydro Electrical	• This harnesses energy from water held behind a dam • Hasto be created by flooding land –damaging wildlife habitats • Tidal energy comes from using energy from waves
Biomass	• This is fuel from natural sources e.g. crops, scrap woods and animal waste • Growing biomass crops produces oxygen and uses up C02 • However, is a very expensive method

2. Storing Energy

Pneumatics: This is the production of energy using compressed gas or air. E.g. Pistons in an engine

Hydraulics: Like a Pneumatic system, but uses water or oil under pressure. E.g. Wheelchair lifts

Kinetic: Energy that is generated by movement. This is stored by items like springs in a "clickable" pen or balloons,

Batteries: Electrical power can be stored in batteries. Rechargeable batteries are becoming increasingly popular.

Design Technology - Timbers & Manufactured Boards

1. Hardwoods

They are deciduous trees which means that in winter, they lose their leaves. These trees are broadleaved, bushy and slow growing. Overall they tend to be harder to work with and more expensive than other types of timbers. They are less porous and denser cell structure which makes them harder wearing and less prone to rotting.

Types:

Name	Characteristics	Uses
Ash 	Flexible, tough and shock resistant, laminates well. Pale brown/cream.	Sports equipment and tool handles.
Beech 	Fine finish, tough and durable. Dense close grain with an	Children's toys, models and furniture.
Mahogany 	Easily worked, durable and finishes well. Rich reddish brown in	High end furniture and joinery.
Oak 	Tough, hard and durable, high quality finish possible. Light brown with variable grain.	Flooring, furniture, and railway sleepers.
Balsa 	Very soft, and lightweight but can snap. Pale cream/ white in colour. Unusually fast growing	Prototyping and modelling - especially in model aircraft.

2. Softwoods

They are coniferous trees which means that they keep their leaves in winter = evergreen. These trees are tall and 'Christmas tree' tree shaped. Overall they tend to be easier to work with and less expensive than other types of timbers. They are more porous (holes) and if unprotected will rot. They have cones for leaves and grow quickly.

Types:

Name	Characteristics	Uses
Larch 	Durable, tough and good water resistance. Machines well.	Exterior cladding, flooring, machine mouldings and furniture.
Pine 	Lightweight, easy to work but can split.	Interior construction, cheaper furniture and decking.
Spruce 	Easy to work, high stiffness to weight ratio.	Construction, furniture and musical instruments.
Redwood 	Easy to work and machines well, some rot resistance.	Outdoor furniture, beams, posts and decking.
Cedar 	Easy to work, can blunt tools, finishes well and naturally resistant to rot.	Outdoor furniture, fences and cladding for buildings.

3. Manufactured boards

They are sheets of processed natural timber and adhesives - so they are human made boards These are usually made from waste wood, low-grade and recycled timber. Can be covered by thin slices of high quality wood known as veneer to make it look aesthetically pleasing. Cheaper than natural timber. They come in boards and have no grain.

Types:

Name	Characteristics	Uses
MDF 	Rigid and stable, good value with a smooth easy to finish surface.	Flat pack furniture, toys and kitchen units.
Plywood 	Stable in all directions as alternating layers. Flexible versions available.	Furniture, shelving, toys, interior and exterior construction.
Chipboard 	Good compressive strength, not water resistant and prone to chipping on edges.	Flooring, low end kitchen units and worktops.
OSB 	Rigid and even strength, good water resistance.	Construction in interior and exterior house building.
Block board 	Stable, tough and heavy. Finishes well.	Furniture, doors, shelving and indoor construction.
Hardboard 	Flexible, even strength and easily damaged by water.	Furniture and photo frame backing.

4. Source/Origin

Timber comes from **trees** - this is known as the source or origin of the material. This is how we change into timber.

1. When trees are cut down, this is known as **felling.** This can be through machine or chain saws, just like the image.

2. Branches are cut off and the logs are stored until they are transported to a **sawmill.**

3. When at the sawmill, machines such as **band saws** and **circular saws** are used to create boards/planks.

5. Environmental impact

Wood is considered a **sustainable resource** as new trees can be grown to replace those felled. Here are some **issues and positives** surrounding the impact that wood is having on the environment:

- In many places, wood is being used at a greater rate which means it is unsustainable.
- Illegal felling is leading to deforestation as people aren't replanting trees.
- Deforestation helps with global warming.

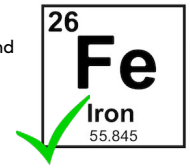
- To make sure you are buying sustainable timber, you need to make sure it is approved by the **Forest Stewardship Council** or the **Endorsement of Forest Certification.**

FSC®

Design Technology – Metals & alloys

1. Ferrous

This group of metals all contain iron.
Most of these metals are magnetic and will rust if they are exposed to moisture without a protective finish.
Iron is what causes the metals to rust quicker. They tend to have a higher melting point.



Types:

Name	Characteristics	Uses
Low Carbon Steel (Mild Steel) 	Tough and ductile, easily machined, formed, brazed or welded.	Construction, nails, screws, nuts and bolts. Many car bodies.
High Carbon Steel 	Less ductile and harder than mild steel. Very hard wearing and keeps and edge well.	Garden or workshop tools, blades, scissors, wood and metal cutting tools.
Cast Iron 	Hard but brittle. Easily cast into complex shapes but some are hard to machine.	Kitchen pots and pans, machine bases and bodies, drain covers and vices.

2. Non ferrous

This group of metals do NOT contain iron.
Most of these metals are not magnetic and do not rust.
These can Oxidise. React with oxygen that causes the surface to change colour.
They include precise metals such as gold, silver and platinum and others such as lead and mercury which are poisonous,

Types:

Name	Characteristics	Uses
Aluminium 	Lightweight, high strength to weight ration, ductile and difficult to weld.	Pots and pans, sports car body panels, bike frames, drinks cans, foil or takeaway trays.
Copper 	Ductile, malleable and a good electrical conductor.	Plumbing supplies, and electrical cables.
Tin 	Soft, malleable and ductile, a good electrical conductor.	Used to produce cans and plating surfaces to make them last.
Zinc 	Fair electrical conductivity, malleability and ductility; however, better when alloyed.	Mainly used to galvanise steel to prevent rusting.

3. Alloys

This group of metals is a mixture of at least one pure metal and another element.
The reason metals are alloyed is so that the added element makes the metal better - it improves it in some way.
These are more difficult to recycle as the metal has been mixed with something else.

Types:

Name	Characteristics	Uses
Brass 	A heavy alloy of zinc and copper that is malleable, easy to cast and machine.	Musical instruments, bushes and plumbing filaments.
Stainless Steel 	Hard very smooth but difficult to weld. A ferrous metal alloyed with chromium, nickel and manganese.	Cutlery, kitchen and medical equipment.
High Speed Steel 	Able to withstand the high temperatures created when machining at high speed, keeps cutting edges well.	Cutting tools such as drill bits, mill cutter, taps and dies.
Duralumin 	Alloy of aluminium, copper, magnesium and manganese. Creates greater hardness and tensile strength.	Aircraft components sports car wheels and casings.

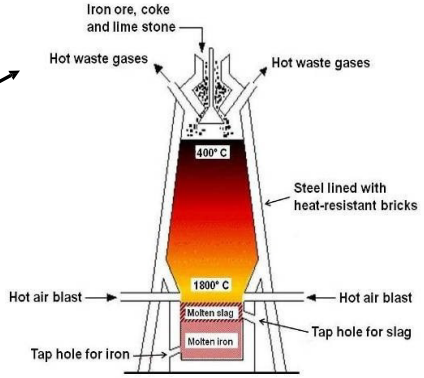
4. Source/Origin

Metals come from the **ground/rocks** typically the Earth's crust - this is known as the source or origin of the material.

This is how we **extract** (remove) metals from the ground and create **iron ore.**

1. The material is mined using machines - the main two types are **surface mining** and **underground mining.**

2. These rocks are then **transported** to a factory to be separated from waste material.



Blast Furnace

3. To create the **iron ore**, the rocks are placed through the top of the furnace and it is heated.

As it heats, it starts to become a liquid and this sinks to the bottom.

As it becomes a liquid it is carried away from the bottom to be **refined** further into metals.

The waste material leaves in the other direction and is known as the **slag.** Waste material also leaves as gases.

5. Environmental impact

Metal is considered a **finite resource** - this means that it will run out eventually as we only have a limited amount. These are some of the impacts that metal has on the environment:

- Finite resource so it will run out eventually.
- Causes **air pollution** from the gases that are released.
- Causes **visual pollution** from the mines that are created to get the raw material.
- Takes a lot of energy to produce.

- Can be recycled over and over again. The quality will always be the same as the original so the material won't weaken over time.
- Lasts a long time and so it won't need to be replaced.
- Most metals can be recycled.

Design Technology – Polymers (Plastics)

1. Thermoforming

This group of polymers are able to be formed into a different shape over and over again. Known as thermoplastics.

These are generally more flexible, especially when heated. These are easier to recycle.

Can be formed into complex shapes.

Name	Characteristics	Uses
Polyethylene terephthalate (1 PETE)	Easily blow moulded and fully recyclable.	Bottles, food packaging, sheeting and some food wraps.
High density Polyethylene (2 HDPE)	Lightweight, rip and chemical proof.	Milk bottles, pipes, hard hats and wheelie bins.
Polyvinyl Chloride (03 PVC)	Flexible, high plasticity, tough and easily extruded.	Raincoats, pipes, Electrical tape and blow up mattresses.
Low density Polyethylene (4 LDPE)	Very flexible and tough with a high strength to weight ratio.	Plastic carrier bags and black bin bags.
Polypropylene (5 PP)	Flexible, tough, lightweight, easily cleaned and safe with food.	Kitchen, medical and stationery products.
High Impact Polystyrene (HIPS). (6 PS)	Flexible, impact resistant, lightweight and can be food safe. Toxic when burned.	Vacuum formed products such as food containers or yoghurt pots.
Acrylic (7 OTHER)	Tough but brittle, easily scratched . Common in school workshop for the laser cutter.	Car lights, display stands, trophies, jumpers, hats and gloves.

Polymorph

Non toxic, easily mouldable and re-mouldable when heated. Used for modelling or personalisation of hand grips.

2. Thermosetting

This group of polymers, once set in shape CANNOT be reformed. Known as thermosets. These are generally more rigid before and after they've been heated. These are harder to recycle. Make excellent electrical insulators.

Name	Characteristics	Uses
Epoxy resin 	Stronger than other resins, expensive and heat resistant.	Bonding different materials together.
Melamine formaldehyde 	Food safe, hygienic and lightweight.	Kitchenware - but it can't be put in the microwave
Urea formaldehyde 	Heat resistant and very good electrical insulator	Electrical fittings, casings, buttons and handles.
Polyester resin 	Reasonably strong, heat resistant and a good electrical insulator.	Waterproof coatings and flooring.
Phenol formaldehyde 	Very hard and brittle. An excellent electrical insulator.	Electrical components, mechanical parts.

4. Biopolymers

Newer plastics are made from **vegetable starches** and can be composted - these are great for the environment. Here are some:

PLA - Polylactic Acid

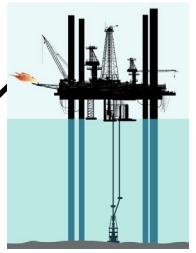
Non toxic, easily shaped and typically used for 3D printers.

Used for pens, phone cases, disposable food and drinks containers.

3. Soure/Origin

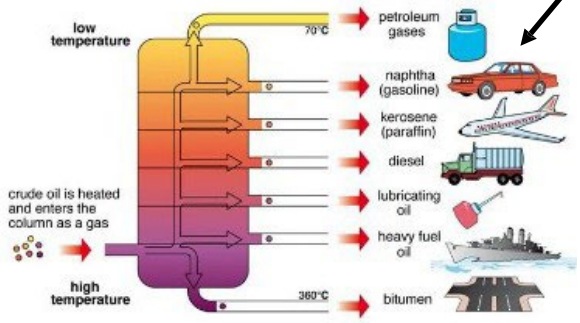
Polymers come from **crude oil.** They can also come from **gas** and **coal.** This can be found beneath the Earth's surface. Below is how we get it and change it into polymers:

1. The oil is **extracted** from beneath the surface and stored. This can be done on land or in the sea.



2. This oil is then **transported** via a **crude tanker** to somewhere called an **oil refinery.**

3. When at the refinery, the oil is heated and at **different temperatures** this creates the different **products.**



5. Environmental impact

Polymers are considered a **finite resource** - this means that it will run out eventually as we only have a limited amount. However with development in technology there are some **biodegradable** ones, here are some of the impacts:

- Do not biodegrade easily so release harmful toxins in landfills.
- Causes **air, visual** and **water pollution.**
- Takes a lot of energy to produce.

- Some are able to be recycled so they don't use raw material (brand new e.g. crude oil).
- New technology has given way to fully biodegradable ones - **biopolymers,** so they are non toxic and not from a finite resource.

Design Technology – Textiles

1. Natural fibres

Natural fibres come from 2 sources – these are plant based and animal based.
Fabrics from plant based are renewable but take a long time to grow.

Types:

Name	Characteristics	Uses
Cotton **(plant)** 	Soft, strong and absorbent, cool to wear and easily washable. Good thermal properties.	Most clothing and can be used for denim.
Wool **(animal - sheep)** 	Can be fine and thick, naturally warm and crease resistant. Can shrink.	Jumpers, coats, suits and carpets.
Silk **(animal - silk worm)** 	Very soft and fine finish, gentle, warm in winter and cool in summer. Absorbent and strong.	Luxury clothing and bed sheets.

2. Synthetic fibres

Synthetic fibres are ones that are man-made.
These can be made from recycled plastic bottles

Types:

Name	Characteristics	Uses
Polyester 	Tough, strong, hard wearing, very versatile, holds colour well and non absorbent.	Clothing, fleece garments, bedsheets, carpets, backpacks and umbrellas.
Polyamide **(Nylon)** 	Good strength, hard wearing, non absorbent, machine washes well.	Clothing, ropes and webbings, parachutes and sports material.
Elastane **(Lycra)** 	Added to fabric to enhance working properties, to add stretch. Freedom of movement	Sportswear, exercise clothing, swimsuits and general clothing.

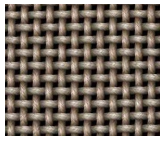
3. Blended & mixed fibres

These fibres have been blended and mixed together - so natural mixed with synthetic.

Types:

Name	Characteristics	Uses
Poly-cotton 	More durable than pure cotton but not as breathable. Can be produced more cheaply.	General clothing, sheets and bedding. Used as alternative to pure cotton.

4. Woven fabrics



These are fabrics where they follow a pattern - one piece goes up and over whilst the over does the opposite. Weaving.

Types:

Name	Characteristics	Uses
Plain weave e.g. muslin and calico. 	Simple and cheaper to produce, stronger than other weaves.	General clothing, sheets and bedding. Used as alternative to pure cotton.

5. Non-Woven fabrics

These are fibres that haven't been spun into yarn - they have been bonded together through heat or adhesive (glue).

Types:

Name	Characteristics	Uses
Bonded fabric 	Lack strength, no grain so can be cut in any direction and not fray.	Disposable products such as protective clothing
Feted fabric 	Can be formed with moisture and heart - no elasticity when it has dried. Pull apart easily.	Hats, soundproofing and insulation.

6. Knitted fabrics

This is when yarn is interlocked (connect) with each other.
Weft - hand or machine and loops across the width.
Warp - these interlock vertically and less prone to unravelling and laddering.

Types:

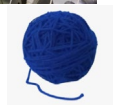
Name	Characteristics	Uses
Knitted fabric 	Warm to wear, different knits have different shapes, stretch and shape retention	Jumpers, cardigans, sportswear and tights.

7. Source/Origin

Fabric can be sourced from many places as you can see from the table. However they are mainly **animal sources, chemical sources and vegetable sources.** Then when you've got the source this is whathappens:

1. This is what some of the **raw fibres** look like, this is once they have all been collected. E.g. you could have a pile of wool or cotton.

2. Then to turn this into yarn, the raw material is spun or twisted by hand or machine. It is spun and twisted until it becomes useable.



3. So it will look something similar to this once it has been further processed, such as being dyed. Some are further processed so they become thinner and smoother.

8. Environmental impact

Here are some of the impacts that manufacturing textiles has on the environment:

They use a lot of water in the processing stages to make sure that they are clean and useable.
When being processed, they will release CO_2 into the environment causing air pollution.
Throw away culture due to fashion

Almost all textiles are recyclable or biodegradable.
Most sources of textiles are considered sustainable as they are available such as the cotton plants and sheep's wool.
Can be reused or donated

Design Technology – Papers & boards

1. Boards

The thickness of boards is measured in microns. 1000 microns = 1mm.

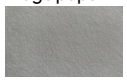
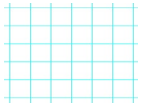
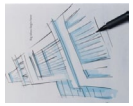
Types:

Name	Characteristics	Uses
Corrugated card 	1000-5000 microns, strong and lightweight. Insulative and easily printed on.	Packaging, boxes and impact protection.
Duplex board 	200-500gsm, stiff, lightweight coatings to improve functionality.	Cheaper version of white card used for packaging boxes. Waxy coating for protection.
Foil lined board 	200-400gsm, stiff, foil reflects heat and a water and oil resistant coating enables food and liquid based products to be contained.	Takeaway containers and lids, used to retain heat for longer.
Foam board 	3-10mm thick, lightweight and rigid in all directions. Can crease and crack under pressure.	Architectural models, model making, prototyping, mounting and framing of photographs.
Ink jet card 	120-350gsm medium to thick card treated to hold a high quality photo image.	High quality photographic images
Solid white board 	200-500gsm, stiff board, holds colour well, easily cut or creased.	Any uses including greeting cards, packaging and advertising.

2. Papers

Paper is measured by weight in grams per square metre (GSM). This is how heavy it will be.

Types:

Name	Characteristics	Uses
Bleed proof paper 	70gsm, coated to stop solvent based markers staining. Ink stays on the surface.	Marker pens when designing and final designs.
Cartridge paper 	120-150gsm, completely opaque and more expensive.	Pencil and ink drawings, sketching and water colour.
Grid paper 	Usually printed onto 80gsm paper with faint lines and often in blue.	Used for graphical, scientific and mathematical diagrams.
Layout paper 	40-60gsm, semi translucent, takes pencil and most media well.	Creating sketches and working ideas.
Tracing paper 	10-120gsm, translucent, takes pencil and most colour well.	Copying and tracing images.

4. Environmental impact

Paper is considered a sustainable resource which means it is something that can continue going as it can be replenished (replaced) for example, you cut down a tree, plant 2 new ones or a new one. Here are some of the impacts on the environment:

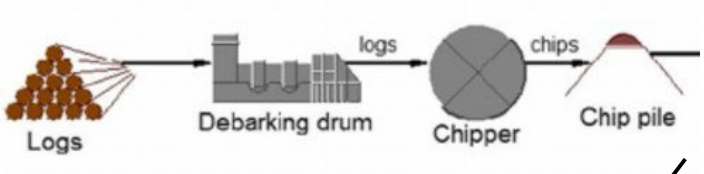
✗ Processing of paper can release chemicals into the environment which is not good for the atmosphere. If put into a land fill, it will release methane over time which is bad for the atmosphere.

✓ Sustainable resource
Can be recycled over and over again
Decomposes over time if it does go into a land fill or if left on the ground.

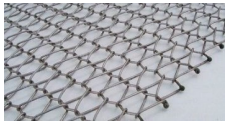
3. Source/Origin

Paper and boards come from finely shredded wood but has been prepared in a special way to make what you know as paper and boards. This is how they are made:

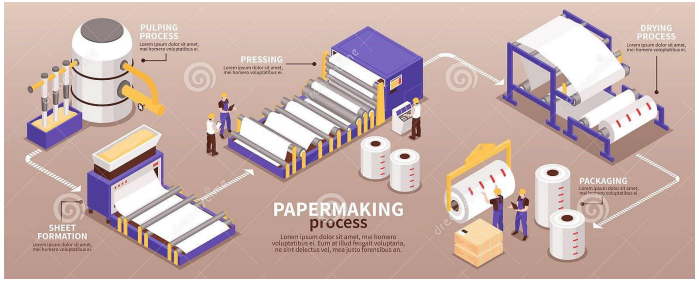
1. Pulp - this is the finely shredded wood. Logs are debarked into fine chips. These are added to a chemical solution and cooked under pressure to make them into a paper pulp. These are called cellulose fibres. Depending on the colour, the fibrous liquid is then bleached or coloured.



2. Sizing - this is a process where chemicals or other additives are beaten into the fibrous liquid. This stops it being so absorbent. This means it can then be photocopied, printed or painted onto. Papers such as toilet roll or kitchen roll have little sizing so that they can absorb moisture. Otherwise they wouldn't work as toilet or kitchen roll.



3. Converting Pulp to Paper - the pulp (so the liquid fibrous) goes on a mesh conveyor belt to drain the excess water. It goes through lots of rollers to squeeze the last of the water out of the paper. Then through drying rollers, so it dries and finally through a set of calender rollers which give the paper the finish e.g. satin or matt. Here's a picture of the overall process together:



Design Technology – Briefs, Specifications, ideas and development

1. Design Briefs

A Design Brief is the statement of how you will solve the Design Problem
It will often include:

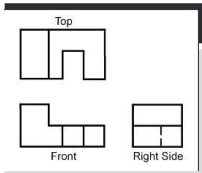
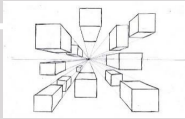
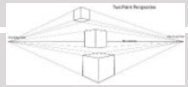
- Constraints/ limitations
- What the product is
- Materials/processes
- Any key information you know

2. Design Specifications

A Design Specification is a list of requirements your product has to meet in order to be successful
It is also useful for evaluation. If your product hasn't met the Spec then it gives you a starting point for improvements.

Aesthetics	What the product looks like? Style? ColourScheme? Design Movement?
Customer	Who would buy it? (Age, gender, socio-economic, personality) How does the design appeal to them?
Cost	How much will it cost? (min-max) Why?
Environment	Where will it be used? Why? How will you make it suitable?
Safety	How is it safe? How will it be checked? Why must it be safe?
Size	What is the maximum or minimum size? Why?
Function	What does the product do? What features make it do that function well? How is it unique from similar products?
Material	What is it made from? Why?
Manufacture	How might it be made? Why? What scale of production? Why?

3.

Technique	Description/ notes	
Orthographic Projection/ Working Drawings	• Includes "Front", "Plan" and "End" 2D Views, and often an Isometric 3D View • Standardised method for scale, dimensions and line types • Great for manufacturing	
Isometric	• Common 3D sketching method • Can be drawn free-hand or using isometric paper and ruler • Angles are at 30 degrees • Great for seeing most of the products	
1-Point Perspective	• A 3D drawing method • Often used by interior designers and architects • Gives drawings depth • Only uses 1 vanishing point	
2-Point Perspective	• Used for 3D designs • Exaggerates the 3D effect • Objects can be drawn above of below the horizon line but must go to the 2 vanishing points	
Annotated Drawings/ Free and Sketches	• Quick and easy way of getting ideas down • Range of ideas can be seen • Annotation helps explain designs further	
Exploded View	• Helps see a final design of a product and all it's parts • Can see where all the parts fit • Great for manufacturers	

4. Modelling and Development

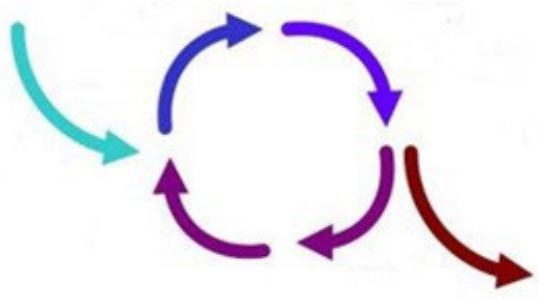
Modelling and development are key to testing and improving products This can be done physically using materials like; card, foam, clay, man-made boards or virtually in CAD.

Modelling helps the designer get feedback from the customer, check aesthetics, function, sizes and even materials and production methods and change them if needed

Design Technology – Design strategies

Design Strategies are used to solve Design Fixation, and help develop creative design ideas.

1. Iterative Design



- A Proposal is made
- It is then planned and developed to meet the brief
- It is analysed and refined
- It is then tested and modelled
- Then evaluated against the brief – many versions fail but that then informs development to make the idea better
- The cycle then repeats and if the product is successful it is then made and sold on the market

Advantages	Disadvantages
• Consistent testing helps solve problems earlier • Constant feedback • Easy evidence of progress	• Designers can loose sight of "the big picture" • Time consuming

2. User-Centred Design

- This is when designs are based on fulfilling the needs and wants of the Users/Clients at every stage of the design process
- Questioning and testing is ongoing and is often found through

Advantages	Disadvantages
• User feels listened to • Makes sure the product meets their needs	• Requires extra time to get customer feedback • If focused on just one person it can limit appeal to others

3. Systems Approach

- Usually used for electronic products
- Often uses diagrams to show systems in a visual way
- Planning the layout for the correct sequences e.g. inputs, outputs, timings, etc.
- Electronics and mechanical systems need an ordered and logical approach

Advantages	Disadvantages
• Does not need specialist knowledge • Easy to communicate stages • Easy to find errors	• Sometimes over-simplifies stages • Can lead to unnecessary stages

4. Collaborative Approach

- Working with others to share data and solving problems and coming up with design proposals can help with creativity
- Numerous companies work in teams, and has been shown to improve the range and quality of ideas produced

Advantages	Disadvantages
• Gets multiple opinions and a range of views • Working in groups can produce more ideas	• Can be difficult to design ideas with opposing views • Can be difficult to find time to communicate with multiple people

Design Technology – Wood and boards

1. Natural timbers

Softwoods are generally cheaper than hardwoods as they are more available, since they grow quicker.
But because man-made boards are manufactured they are cheaper than timbers. Man-made boards also come in a better variety of sizes since they don't depend on tree growth.
Stock forms for both include; sheets, dowel, planks, etc

Hardwoods come from Deciduous Trees. These trees loose leaves in winter and grow fruit and flowers in spring		
Material	Key info	Examples
Ash	Flexible, tough and shock resistant	Sports equipment Tool Handles
Beech	Fine finish, tough and durable	Toys, furniture and veneers
Mahogany	Easily worked, durable, high quality finish	High-end furniture
Balsa	Very soft and spongy. Light	Modelling
Oak	Tough, durable and hard	Flooring, furniture and veneers

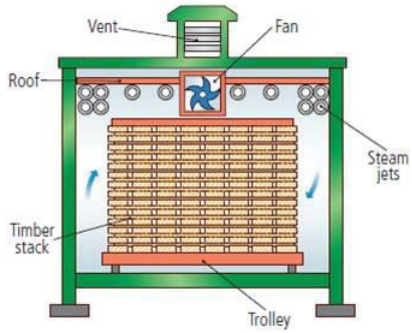
Softwoods come from **Coniferous Trees.** These have thin, needle-like leaves and grow all year round. Often have pine cones and sometimes nuts and seeds		
Material	Key info	Examples
Larch	Durable, tough, good water resistance and finishes well	Furniture, flooring and used outdoors
Pine	Light, easy to work with but can split	Cheap furniture, construction and decking
Spruce	Easy to work with, high stiffness but can decay quickly	Furniture, musical instruments and construction

2. Man made boards

Manufactured boards are made from wood chips/dust/ layers and glue.		
Material	Key info	Examples
Chipboard	Prone to chipping but good compressive strength. Not-water resistant	Flooring, low-end furniture, flat-pack
MDF	Rigid and stable. Easy to finish. Absorbs liquid easily	Flat-pack furniture and kitchen unites
Plywood	Very stable. Exterior veneer can be used from more expensive woods	Shelving, furniture, toys

3. Primary Processing of Papers and Boards

Trees are cut then converted into planks by cut using saws
It is then seasoned to reduce the moisture in the wood. This is done by either:
Air-drying – Planks are stacked and air allowed to circulate; causing evaporation
Kiln-drying – Where planks are put into a kiln and dried rapidly. This process is more costly than air-drying



Manufactured boards can be either be made by lamination or compression

Lamination – Layers of woods and adhesive are layered and compressed together. Usually with a more expensive wooden veneer on the top.

Compression – Wood is shredded, heated and compressed with adhesive under extreme pressure.

Geography - The Changing Economic World

1. What is development?

Development is an improvement in living standards through better use of resources.

Economic	This is progress in economic growth through levels of industrialisation and use of technology.
Social	This is an improvement in people's standard of living. For example, clean water and electricity.
Environmental	This is an improvement in people's standard of living. For example, clean water and electricity.

2. Measuring development

These are used to compare and understand a country's level of development.

Economic indictors examples

Employment type	The proportion of the population working in primary, secondary, tertiary and quaternary industries.
Gross Domestic Product per capita	This is the total value of goods and services produced in a country per person, per year.
Gross National Income per capita	This is the total value of goods and services produced in a country per person, per year.

Social indicators examples

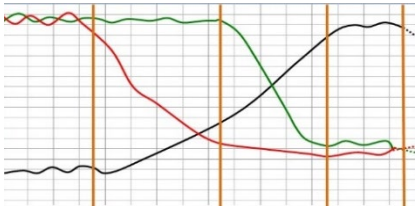
Infant mortality	The number of children who die before reaching 1 per 1000 babies born.
Literacy rate	The percentage of population over the age of 15 who can read and write.
Life expectancy	The average lifespan of someone born in that country.

mixed indicators

Human Development Index (HDI)	A number that uses life expectancy, education level and income per person.

3. The Demographic Transition Model

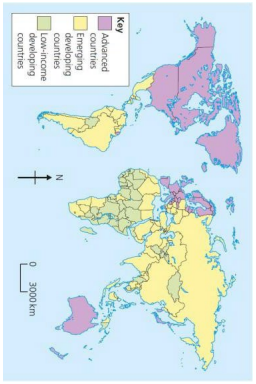
The demographic transition model (DTM) shows population change over time. It studies how birth rate and death rate affect the total population of a country.



STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
High DR High BR Steady	BR Low Declining DR Very High	Rapidly falling DR Low BR High	Low DR Low BR Zero	Slowly Falling DR Low BR Negative
e.g. Tribes	e.g. Kenya	e.g. India	e.g. UK	e.g. Japan

4. Variations in the level of development

LICs	Poorest countries in the world. GNI per capita is low and most citizens have a low standard of living.
NEEs	These countries are getting richer as their economy is progressing from the primary industry to the secondary industry. Greater exports leads to better wages.
HICs	These countries are wealthy with a high GNI per capita and standards of living. These countries can spend money on services.



5. Causes of uneven development

Development is globally uneven with most HICs located in Europe, North America and Oceania. Most NEEs are in Asia and South America, whilst most LICs are in Africa. Remember, development can also vary within countries too.

6. Physical factors affecting uneven development

Natural resources

- Fuel sources such as oil.
- Minerals and metals for fuel.
- Availability for timber.
- Access to safe water.

Climate

- Reliability of rainfall to benefit farming.
- Extreme climates limit industry and affect health.
- Climate can attract tourists.

Natural Hazards

- Risk of tectonic hazards.
- Benefits from volcanic material and floodwater.
- Frequent hazards undermines redevelopment

Location/Terrain

- Landlocked countries may find trade difficulties.
- Mountainous terrain makes farming difficult.
- Scenery attracts tourists.

7. Human factors affecting uneven development

Aid

- Aid can help some countries develop key projects for infrastructure faster.
- Aid can improve services such as schools, hospitals and roads.
- Too much reliance on aid might stop other trade links becoming established.

Trade

- Countries that export more than they import have a trade surplus. This can improve the national economy.
- Having good trade relationships.
- Trading goods and services is more profitable than raw materials.

Education

- Education creates a skilled workforce meaning more goods and services are produced.
- Educated people earn more money, meaning they also pay more taxes. This money can help develop the country in the future.

Health

- Lack of clean water and poor healthcare means a large number of people suffer from diseases.
- People who are ill cannot work so there is little contribution to the economy.
- More money on healthcare means less spent on development.

Politics

- Corruption in local and national governments.
- The stability of the government can affect the country's ability to trade.
- Ability of the country to invest into services and infrastructure.

History

- Colonialism has helped Europe develop, but slowed down development in many other countries.
- Countries that went through industrialisation a while ago, have now develop further.

Geography - The Changing Economic World

8. Consequences of Uneven Development

Levels of development are different in different countries. This uneven development has consequences for countries, especially in wealth, health and migration.

Wealth	People in more developed countries have higher incomes than less developed countries.
Health	Better healthcare means that people in more developed countries live longer than those in less developed countries.
Migration	If nearby countries have higher levels of development or are secure, people will move to seek better opportunities and standard of living.

9. Reducing the Global Development Gap

Microfinance Loans

This involves people in LICs receiving smalls loans from traditional banks.

- ✓ Loans enable people to begin their own businesses
- × Its not clear they can reduce poverty at a large scale.

Aid

This is given by one country to another as money or resources.

- ✓ Improve literacy rates, building dams, improving agriculture.
- × Can be wasted by corrupt governments or they can become too reliant on aid.

Fair trade

This is a movement where farmers get a fair price for the goods produced.

- ✓ Paid fairly so they can develop schools & health centres
- × Only a tiny proportion of the extra money reaches producers.

Foreign-direct investment

This is when one country buys property or infrastructure in another country.

- ✓ Leads to better access to finance, technology & expertise.
- × Investment can come with strings attached that countries will need to comply with

Debt Relief

This is when a country's debt is cancelled or interest rates are lowered.

- ✓ Means more money can be spent on development.
- × Locals might not always get a say. Some aid can be tied under condition from donor country.

Technology

Includes tools, machines and affordable equipment that improve quality of life.

- ✓ Renewable energy is less expensive and polluting.
- × Requires initial investment and skills in operating technology

10. CS: Reducing the Development Gap In Jamaica

Location and Background

Jamaica is a LIC island nation part of the Caribbean. Location makes Jamaica an attractive place for visitors to explore the tropical blue seas, skies and palm filled sandy beaches

Tourist economy

- In 2015, 2.12 million visited.
- Tourism contributes 27% of GDP and will increase to 38% by 2025.
- 130,000 jobs rely on tourism.
- Global recession 2008 caused a decline in tourism. Now tourism is beginning to recover.

Multiplier effect

- Jobs from tourism have meant more money has been spent in shops and other businesses.
- Government has invested in infrastructure to support tourism.
- New sewage treatment plants have reduced pollution.

Development Problems

- Tourists do not always spend much money outside their resorts.
- Infrastructure improvements have not spread to the whole island.
- Many people in Jamaica still live in poor quality housing and lack basic services such as healthcare.

11. Case Study: Economic Development in Nigeria

Location & Importance

Nigeria is a NEE in West Africa. Nigeria is just north of the Equator and experiences a range of environments.

Nigeria is the most populous and economically powerful country in Africa. Economic growth has been based on oil exports.

Influences upon Nigeria's development

Political

Suffered instability with a civil war between 1967-1970.

From 1999, the country became stable with free and fair elections.

Stability has encouraged global investment from China and USA.

Cultural

Nigeria's diversity has created rich and varied artistic culture.

The country has a rich music, literacy and film industry (i.e. Nollywood).

A successful national football side.

The role of TNCs

TNCs such as Shell have played an important role in its economy.

- ✓ Investment has increased employment and income.
- × Profits move to HICs.
- × Many oil spills have damaged fragile environments.

Social

Nigeria is a multi-cultural, multi-faith society.

Although mostly a strength, diversity has caused regional conflicts from groups such as the Boko Haram terrorists.

Industrial Structures

Once mainly based on agriculture, 50% of its economy is now manufacturing and services.

A thriving manufacturing industry is increasing foreign investment and employment opportunities.

Changing Relationships

Nigeria plays a leading role with the African Union and UN.

Growing links with China with huge investment in infrastructure.

Main import includes petrol from the EU, cars from Brazil and phones from China.

Geography - The Changing Economic World

10. Case Study: Economic Development in Nigeria

Environmental Impacts

The 2008/09 oil spills devastated swamps and its ecosystems.

Industry has caused toxic chemicals to be discharged in open sewers - risking human health.

80% of forest have been cut down. This also increases CO^2 emissions.

Aid & Debt relief

- ✓ Receives $5billion per year in aid.
- ✓ Aid groups (ActionAid) have improved health centres, provided anti-mosquito nets and helped to protect people against AIDS/HIV.
- × Some aid fails to reach the people who need it due to corruption.

Effects of Economic Development

Life expectancy has increased from 46 to 53 years. 64% have access to safe water. Typical schooling years has increased from 7 to 9.

11. Case Study: Economic Change in the UK

UK in the Wider World

The UK has one of the largest economies in the world.

The UK has huge political, economic and cultural influences.

The UK is highly regarded for its fairness and tolerance.

The UK has global transport links i.e. Heathrow and the Eurostar.

Causes of Economic Change

De-industrialisation and the decline of the UK's industrial base.

Globalisation has meant many industries have moved overseas, where labour costs are lower.

Government investing in supporting vital businesses.

Towards Post-Industrial

The quaternary industry has increased, whilst secondary has decreased.

Numbers in primary and tertiary industry has stayed the steady.

Big increase in professional and technical jobs.

Developments of Science Parks

Science Parks are groups of scientific and technical knowledge based businesses on a single site.

- Access to transport routes.
- Highly educated workers.
- Staff benefit from attractive working conditions.
- Attracts clusters of related high-tech businesses.

CS: UK Car Industry

Every year the UK makes 1.5 million cars. These factories are owned by large TNCs. i.e. Nissan.

- 7% of energy used there factories is from wind energy.
- New cars are more energy efficient and lighter.
- Nissan produces electric and hybrid cars.

Change to a Rural Landscape

Social

Rising house prices have caused tensions in villages.

Villages are unpopulated during the day causing loss of identity.

Resentment towards poor migrant communities.

Economic

Lack of affordable housing for local first time buyers.

Sales of farmland has increased rural unemployment.

Influx of poor migrants puts pressures on local services.

Improvements to Transport

A £15 billion 'Road Improvement Strategy'. This will involve 10 new roads and 1,600 extra lanes.

£50 billion HS2 railway to improve connections between key UK cities.

£18 billion on Heathrow's controversial third runway.

UK has many large ports for importing and exporting goods.

UK North/South Divide

- – Wages are lower in the North.
- – Health is better in the South.
- – Education is worse in the North.
- ✓ The government is aiming to support a Northern Powerhouse project to resolve regional differences.
- ✓ More devolving of powers to disadvantaged regions.

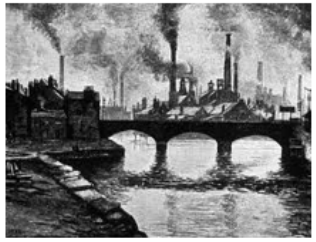
Geography – UK Economy

Why is there a north-south divide?

Industrial Revolution

UK growth was centred around the coalfields of Wales, N England and Scotland

Heavy industries thrived in Sheffield, Glasgow & Manchester



Industrial Decline

Since the 1970's steel & heavy industries have declined

Unemployment has increased

Coalfields have become exhausted

By train from Cambridge Science Park it takes 52 minutes to get to London

Close to Stansted airport (Gatwick and Heathrow via the M25)

Background information

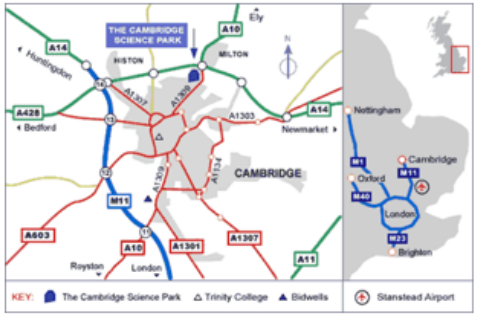
The Cambridge Science Park, founded by Trinity College in 1970 is the oldest Science Park in the United Kingdom.

It is a concentration of science and technology related businesses, and has strong links with the nearby city of Cambridge.

Cambridge Science park is home to more than 100 businesses which are involved in lots of areas of expertise such as medical , IT and environmental.

There is a large range of services on site to help the people who work in the Park. Some of the environmentally friendly services include recycling facilities and landscaping to attract more wildlife to the area

The science Park is close to Cambridge University so that it can draw on scientific knowledge of many experts.



The location of Cambridge Science Park at a national and regional scale

Facilities:

- Landscaped surroundings
- Nurseries
- Health and fitness centre
- Cafes
- Conference facilities

Microsoft

Cambridge science park received a huge boost when Microsoft pledged £50 million to build its first European computer research centre there in 1997.

Microsoft

Geography – Physical landscapes - rivers

Hard engineering defences

Groynes	Wood barriers prevent longshore drift, so the beach can build up.	✓ Beach still accessible. ✗ No deposition further down coast = erodes faster.
Sea Walls	Concrete walls break up the energy of the wave . Has a lip to stop waves going over.	✓ Long life span ✓ Protects from flooding ✗ Curved shape encourages erosion of beach deposits.
Gabions or Rip Rap	Cages of rocks/boulders absorb the waves energy, protecting the cliff behind.	✓ Cheap ✓ Local material can be used to look less strange. ✗ Will need replacing.

Soft Engineering Defences

Beach Nourishment	Beaches built up with sand, so waves have to travel further before eroding cliffs.	✓ Cheap ✓ Beach for tourists. ✗ Storms = need replacing. ✗ Offshore dredging damages seabed.
Managed Retreat	Low value areas of the coast are left to flood & erode.	✓ Reduce flood risk ✓ Creates wildlife habitats. ✗ Compensation for land.
Groynes	Wood barriers prevent longshore drift, so the beach can build up.	✓ Beach still accessible. ✗ No deposition further down coast = erodes faster.
Sea Walls	Concrete walls break up the energy of the wave . Has a lip to stop waves going over.	✓ Long life span ✓ Protects from flooding ✗ Curved shape encourages erosion of beach deposits.
Gabions or Rip Rap	Cages of rocks/boulders absorb the waves energy, protecting the cliff behind.	✓ Cheap ✓ Local material can be used to look less strange. ✗ Will need replacing.

Case Study: Hunstanton Coast

Location and Background

Located on the North-West coast of Norfolk. The town is a popular sea resort for tourists to visit all year round.
In 2013, the town suffered damage from a storm surge. The Sea Life Centre was flooded and closed for a number of months.

Geomorphic Processes

- Old Hunstanton is dominated by dunes that are formed when sand is trapped and built up behind objects.
-Hunstanton Cliffs are made from three different bands of rock (sandstone, red chalk and white chalk).
-Hunstanton Cliff are exposed to cliff retreat. This is when a wave-cut notch develops enough for the cliff face to become unstable and eventually collapses.
-Longshore drift travels from Sheringham in the north to the Wash in the south.

Management

-Hunstanton is protected by a number of groynes. These trap sand to build up the beach for better protection.
-The town is also protected by large sea walls to prevent flooding and deflect the waves energy.
-$15 million has been spent on beach nourishment to add sediment to beach for increased protection against flooding.

Water cycle key terms

Precipitation	Moisture falling from clouds as rain, snow or hail.
Interception	Vegetation prevent water reaching the ground.
Surface Runoff	Water flowing over surface of the land into rivers
Infiltration	Water absorbed into the soil from the ground.
Transpiration	Water lost through leaves of plants.
Precipitation	Moisture falling from clouds as rain, snow or hail.

Physical and Human Causes of Flooding.

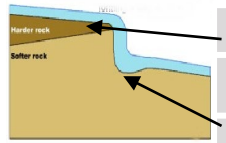
Physical: Prolong & heavy rainfall
Long periods of rain causes soil to become saturated leading runoff.
Physical: Geology
Impermeable rocks causes surface runoff to increase river discharge.
Physical: Relief
Steep-sided valleys channels water to flow quickly into rivers causing greater discharge.
Human: Land Use
Tarmac and concrete are impermeable. This prevents infiltration & causes surface runoff.

Upper Course of a River

Social

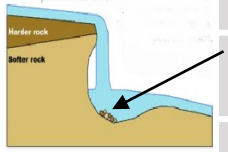
Near the source, the river flows over steep gradient from the hill/mountains. This gives the river a lot of energy, so it will erode the riverbed vertically to form narrow valleys.

Formation of a Waterfall



1) River flows over alternative types of rocks.

2) River erodes soft rock faster creating a step.



3) Further hydraulic action and abrasion form a plunge pool beneath.

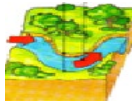
4) Hard rock above is undercut leaving cap rock which collapses providing more material for erosion.

5) Waterfall retreats leaving steep sided gorge.

Middle Course of a River

Here the gradient gets gentler, so the water has less energy and moves more slowly. The river will begin to erode laterally making the river wider.

Step 1



Erosion of outer bank forms river cliff.
Deposition inner bank forms slip off slope.

Step 2

Further hydraulic action and abrasion of outer banks, neck gets smaller.

Step 3

Erosion breaks through neck, so river takes the fastest route, redirecting flow

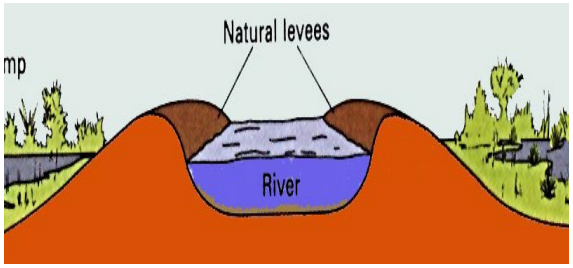
Step 4

Evaporation and deposition cuts off main channel leaving an oxbow lake.

Geography – Physical landscapes - rivers

Lower Course of a River

Near the river's mouth, the river widens further and becomes flatter. Material transported is deposited .



Formation of Floodplains and levees

When a river floods, fine silt/alluvium is deposited on the valley floor. Closer to the river's banks, the heavier materials build up to form natural levees.

- ✓ Nutrient rich soil makes it ideal for farming.
- ✓ Flat land for building houses.

River Management Schemes

Soft Engineering

Afforestation – plant trees to soak up rainwater, reduces flood risk.
Demountable Flood Barriers put in place when warning raised.
Managed Flooding – naturally let areas flood, protect settlements.

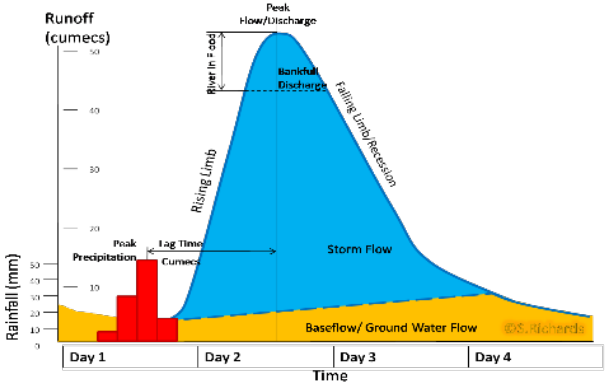
Hard Engineering

Straightening Channel – increases velocity to remove flood water.
Artificial Levees – heightens river so flood water is contained.
Deepening or widening river to increase capacity for a flood.

Hydrographs and River Discharge

River discharge is the volume of water that flows in a river. Hydrographs who discharge at a certain point in a river changes over time in relation to rainfall

1. Peak discharge is the discharge in a period of time.
2. Lag time is the delay between peak rainfall and peak discharge.
3. Rising limb is the increase in river discharge.
4. Falling limb is the decrease in river discharge to normal level.



Case Study: The River Tees

Location and Background

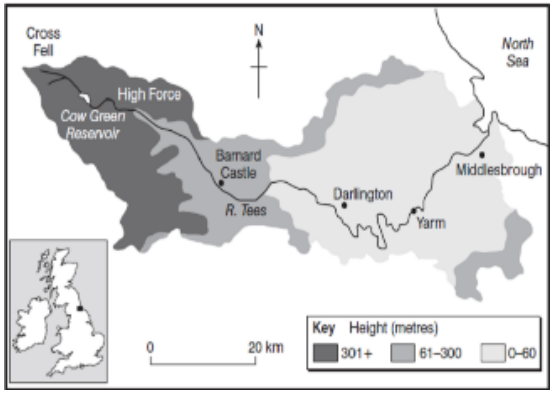
Located in the North of England and flows 137km from the Pennines to the North Sea at Red Car.

Geomorphic Processes

Upper – Features include V-Shaped valley, rapids and waterfalls. Highforce Waterfall drops 21m and is made from harder Whinstone and softer limestone rocks. Gradually a gorge has been formed.

Middle – Features include meanders and ox-bow lakes. The meander near Yarm encloses the town.

Lower – Greater lateral erosion creates features such as floodplains & levees. Mudflats at the river's estuary.



Management

-Towns such as Yarm and Middleborough are economically and socially important due to houses and jobs that are located there.

-Dams and reservoirs in the upper course, controls river's flow during high & low rainfall.

- Better flood warning systems, more flood zoning and river dredging reduces flooding.

Geography – The challenge of resource management

Resource challenges

Resources are things that humans require for life or to make our lives easier. Humans are becoming increasingly dependent on exploiting these resources, and as a result they are in high demand.

Significance of Water

Resources such as food, energy and water are what is needed for basic human development.

Food	Water	Energy
Without enough nutritious food, people can become malnourished. This can make them ill . This can prevent people working or receiving education.	People need a supply of clean and safe water for drinking, cooking and washing. Water is also needed for food, clothes and other products.	A good supply of energy is needed for a basic standard of living. People need light and heat for cooking or to stay warm. It is also needed for industry.

Demand outstripping supply

The demand for resources like food, water and energy is rising so quickly that supply cannot always keep up. Importantly, access to these resources vary dramatically in different locations.

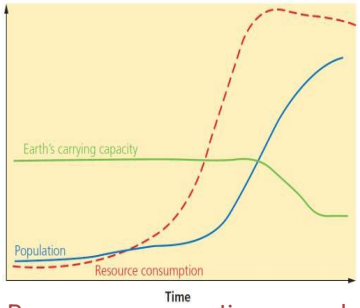
1. Population Growth

- Currently the global population is 7.3 billion.
- Global population has risen exponentially this century.
- Global population is expected to reach 9 billion by 2050.
- With more people, the demand for food, water, energy, jobs and space will increase.

2. Economic Development

- As LICs and NEEs develop further, they require more energy for industry.
- LICs and NEEs want similar lifestyles to HICs, therefore they will need to consume more resources.
- Development means more water is required for food production as diets improve

Resource Reliance Graph



Consumption – The act of using up resources or purchasing goods and produce.
Carry Capacity – A maximum number of species that can be supported.

Resource consumption exceeds Earth's ability to provide!

3. Changing Technology and Employment

- The demand for resources has driven the need for new technology to reach or gain more resources.
- More people in the secondary and tertiary industry has increased the demand for resources required for electronics and robotics.

Food in the UK

Growing demand

- The UK imports about 40% of its food. This increases people's carbon footprint.
- There is growing demand for greater choice of exotic foods needed all year round.
- Foods from abroad are more affordable.
- Many food types are unsuitable to be grown in the UK.

Impact on demand

Foods can travel long distances (food miles). Importing food adds to our carbon footprint.
+ Supports workers with an income + Supports families in LICs.
+ Taxes from farmers' incomes contribute to local services.
- Less land for locals to grow their own food.
- Farmers exposed to chemicals.

Impact on demand

Farming is being treated like a large industrial business. This is increasing food production.
+ Intensive faming maximises the amount of food produced.
+ Using machinery which increases the farms efficiency.
- Only employs a small number of workers.
- Chemicals used on farms damages the habitats and wildlife

Sustainable foods

Organic foods that have little impact on the environment and are healthier have been rising.

- Local food sourcing is also rising in popularity.
- Reduces emissions by only eating food from the UK.
- Buying locally sourced food supports local shops and farms.
- A third of people grow their own food.

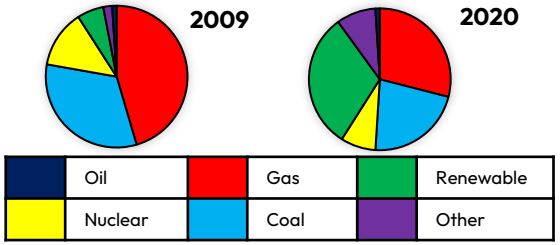
Energy in the UK

Growing demand

The UK consumes less energy than compared to the 1970s despite a smaller population. This is due to the decline of industry.

Changes in Energy Mix

- 75% of the UK's oil and gas has been used up.
- Coal consumption has declined.
- UK has become too dependent on imported energy.



Energy Mix

The majority of UK's energy mix comes from fossil fuels. By 2020, the UK aims for 15% of its energy to come from renewable sources. These renewable sources do not contribute to climate change.

Significance of Renewables
+ The UK government is investing more into low carbon alternatives.
+ UK government aims to meet targets for reducing emissions.
+ Renewable sources include wind, solar and tidal energy.
- Although infinite, renewables are still expensive to install.
- Shale gas deposits may be exploited in the near future

Nuclear	New plants provide job opportunities. Problems with safety and possible harm to wildlife. Nuclear plants are expensive.
Wind Farm	Locals have low energy bills. Reduces carbon footprint. Construction cost is high. Visual impacts on landscape. Noise from wind turbines.

Geography – The challenge of resource management

Water in the UK

Growing Demand

The average water used per household has risen by 70%. This growing demand is predicted to increase by 5% by 2020.

This is due to:

- A growing UK population.
- Water-intensive appliances.
- Showers and baths taken.
- Industrial and leisure use.
- Watering greenhouses.

Deficit and Surplus

The north and west have a water surplus (more water than is required).

The south and east have a water deficit (more water needed than is actually available).

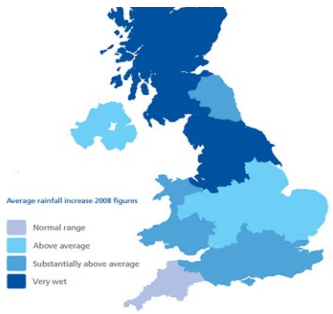
More than half of England is experiencing water stress (where demand exceeds supply).

Pollution and Quality

Cause and effects include:

- Chemical run-off from farmland can destroy habitats and kills animals.
- Oil from boats and ships poisons wildlife.
- Untreated waste from industries creates unsafe drinking water.
- Sewage containing bacteria spreads infectious diseases.

Water stress in the UK



Management

UK has strict laws that limits the amount of discharge from factories and farms.

Education campaigns to inform what can be disposed of safety.

Waste water treatment plants remove dangerous elements to then be used for safe drinking.

Pollution traps catch and filter pollutants.

Water Transfer

Water transfer involves moving water through pipes from areas of surplus (Wales) to areas of deficit (London).

Opposition includes:

- Effects on land and wildlife.
- High maintenance costs.
- The amount of energy required to move water over long distances.

Option 1: Food

Food Security is when people at all times need to have physical & economic access to food to meet their dietary needs for an active & healthy life. This is the opposite to Food Insecurity which is when someone is unsure when they might next eat.

Human	Physical
• Poverty prevents people affording food and buying equipment. • Conflict disrupts farming and prevents supplies. • Food waste due to poor transport and storage. • Climate Change is affecting rainfall patterns making food production difficult.	• The quality of soil is important to ensure crops have key nutrients. • Water supply needs to be reliable to allow food to grow. • Pest, diseases and parasites can destroy vast amounts of crops that are necessary to populations. • Extreme weather events can damage crops (i.e. floods).

Increasing Food Supply

Hydroponics - A method of growing plants without soil. Instead they use nutrient solution.

New Green Revolution - Aims to improve yields in a more sustainable way. Involves using both GM varieties and traditional and organic farming.

Biotechnology - Genetically modified (GM) crops changes the DNA of foods to enhance productivity and properties.

Irrigation - Artificially watering the land so crops can grow. Useful in dry areas to make crops more productive.

Sustainable Food Supply

This ensures that fertile soil, water and environmental resources are available for future generations.

Organic Farming - The banned use of chemicals and ensuring animals are raised naturally.

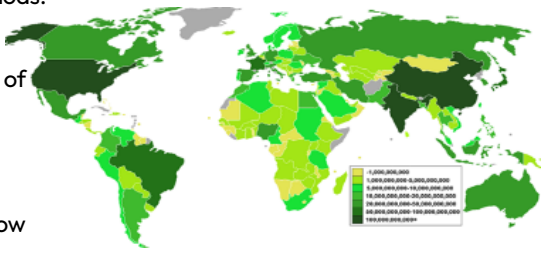
Permaculture - People growing their own food and changing eating habits. Fewer resources are required.

Urban Farming - Planting crops in urban areas. i.e. roundabouts.

Managed Fishing – Includes setting catch limits, banning trawling and promoting pole and line methods.

Food Supply

This map shows the amount of food produced in different countries. Whilst Asia and North America have high production outputs, Africa and Central America have low production outputs.



C.S. Thanet Earth

Located in Kent, the site involves four huge greenhouses using hydroponics.

Advantages

- Supports more than 500 jobs.
- Produces food all year round.
- Provides UK with food security

Disadvantages

- Money generated mostly goes to large companies not community.
- Requires a lot of energy.
- Causes visual & light pollution.

C.S. NEE- Indus Basin Irrigation System

Largest irrigation scheme in the world. Involves large and small dams. Thousands of channels provides water to support Pakistan's rich farmlands.

Advantages

- Improves food security by adding 40% more land for farming.
- Increased yield & range of foods.

Disadvantages

- Few take an unfair share of water
- Water is wasted and demand is rising due to population growth.
- High cost to maintain reservoirs.

Health and social care

1. Key Words	Definitions
Life Stages	A number of distinct phases people pass through during their lives.
Gross Motor Skill	The ability to move and co-ordinate the movement of the large limbs of the body, e.g. crawling, walking, and climbing, running.
Fine Motor Skills	The ability to move and co-ordinate the movement of the hands and fingers, e.g. writing, painting, tying shoe laces, holding a spoon.
Language Development	The Process which children go through as they learn to communicate with others using words and speech.
Egocentric	Seeing things from only your own perspective or viewpoint. Bond: To form an attachment with a parent or carer.
Growth	An increase in size, height and weight which can be measured.
Development	How the child gains skills and is able to control the actions their body makes
Dominant Genes	only one parent needs to have/carry the condition for the child to inherit the condition e.g. Huntington's Disease.
Recessive Genes	Both parents need to have/carry the condition for the child to inherit it e.g. cystic fibrosis.

2. Topic Content

- You will learn to interpret indicators that can be used to measure physiological health and lifestyle data.
- You will learn how to design a health and wellbeing plan including SMART targets (long/short term)
- This unit combines and builds on everything from Components 1 and 2

3.Learning objectives

A –Factors that affect health and wellbeing

B – interpreting health indicators

C- Person-centred approaches to improving health and wellbeing

4. What are Pies development?

P – Physical Development

I – Intellectual Development

E - Emotional Development

S - Social Development

Self-Image: The mental picture we have of ourselves. Some people see themselves in a positive light – for instance, intelligent, attractive and talented whereas other may see only negatives.

Self Esteem How much you like, accept and respect yourself – this is often talked about in terms of how much you value yourself.

Social Development: The ability to interact with others and build relationships.

Oestrogen: A hormone produced in a woman's ovaries that controls the development of sexual characteristics and stimulates changes in the reproductive organs.

Testosterone: A hormone produced by the testes that controls the development of male sexual characteristics.

Abstract thinking: the ability to think about something that might not be there

Person-centred approach: When a patient's care is focused around them and what matters to them. This gives them opportunities to express preferences around their care.

Health and social care

Physical Factors

Inherited conditions: These are conditions that are passed on from parents to children through genes. Examples include sickle cell disease, cystic fibrosis.

Mental Ill Health: Mental health determines how we think/feel and behave as well as how we cope with situations.
Mental ill health is when emotionally, psychologically and socially someone's wellbeing is affected by a condition such as anxiety, stress, depression etc.

Physical abilities: how well you can perform a physical action such as walking, doing buttons etc. can be hugely impacted if we experience any kind of temporary or permanent physical impairment.

Sensory impairments: The loss of one of the 5 senses can have a devastating ability on someone's ability to perform everyday tasks. e.g. loss of vision could reduce someone's ability and confidence to socialise.

Physical Ill health: can be acute, chronic or both.
Acute = comes on quickly, is short-term and can be cured.
Chronic = Life long.
e.g. Asthma is a chronic condition impacting the lungs life long. There is no cure. HOWEVER ... an asthma attack is an acute condition which can be remedied with medication.

Economic Factors

Employment situation – whether someone is working can have a huge impact on their health and wellbeing

Financial Resources – the money and personal wealth at someone's disposal.

Social Factors

Bullying – can take many forms physical, verbal, cyber, emotional and sexual – it is a repetitive intention to harm, coerce or intimidate.

Discrimination – treating someone differently because they are seen as different. This could be for lots of reasons. E.g. gender, age

Lifestyle factors

Nutrition – A balanced diet is essential for a healthy body and mind. People who eat poorly are more prone to illness, being over/under weight
Physical Activity – Regular exercise is essential for our health and wellbeing
Alcohol – Can have a detrimental impact one someone's PIES health. Excessive drinking can lead to addiction and increased risk of cancer.
Smoking – Cigarettes contain highly addictive Nicotine which can have huge impacts on a person's wellbeing and health.
Illegal drugs and misuse of prescribed drugs - can have a profound impact on your health and wellbeing

Environmental Factors:

Housing needs, conditions and locations
The type of housing and the location of housing can hugely impact health and well-being. E.g. small flat in the city could lead to stress and ill-health due to air pollution.
Home environment – living with abuse or neglect can hugely impact health and wellbeing.
Air pollution - can lead to life long health conditions.
Water Pollution – can lead to illness.

Cultural Factors

Religion – being part of a religious group can be positive for health and wellbeing. Many religious groups offer lots of support for individuals within their community.
Community Participation – belonging to a group with which someone identifies e.g. a street organising events together, or a member of the LGBTQIA+ community taking part in a Pride march.
Gender Roles and expectations – The roles and behaviours often stereotypically expected of men and women.
Gender Identity – how a person identifies. There are over 100 genders in the UK.
Sexual Orientation – The emotional, romantic or sexual attraction someone feels for another person/s

History – Paper 1: Medicine Through time, c.1250-Present Day + Medicine in the Trenches 1914-1918

Key Topic 1: What was medicine like in the Medieval Period, c.1250-1500?

Key words	
Physician	A qualified doctor
Symptom	A sign or feature of an illness
Flagellants	Religious people who whipped themselves in hopes that God wouldn't send plague
Miasma	Bad air (poisonous, foul smelling fumes)
Muck rakers / night soil men	Workers hired by local authorities to empty cess pits and dispose of the contents.
Cess pits	Holes in the ground below a privy (toilet) where the waste collected
Blood-letting	Taking blood from a patient in an attempt to treat their illness
Humours	A theory claiming the body is divided into 4 humours or liquids: blood, black bile, yellow bile and phlegm.
Pestilence	A word used in the Middle Ages for the plague
Plague Pneumonic/ Bubonic	Bubonic plague is spread by fleas and originates from black rats from China. Pneumonic plague is spread by a person already with the virus through their coughs and sneezes.
Bubo / buboes	Swollen lumps in armpit and neck glands – a symptom of plague
Planet alignment	When planets in our solar system line up in their orbits. Thought by astrologists to have impact on human health & behaviour

Core knowledge	
1. Name the 2 main influences on medical understanding in the medieval period	Galen and Hippocrates
2. Why couldn't their theories be disproven?	Dissections were banned by the Church
3. Why didn't people question the Church in the medieval period?	Feared they would go to hell
4. What was the 'Theory of the Four Humours'?	If the 4 liquids are not perfectly balanced you will get sick
5. How many physicians were there during the medieval period?	Approx. 100.
6. Who carried out treatments and minor operations?	Barber Surgeons
7. How did 'wise women' treat people?	Herbal remedies
8. How were medieval towns/villages kept clean	'Rakers', Laws against throwing waste
9. When was the Black Death and how many people died?	1348 and 2 million
10. What did people believe caused the Black Death?	God's punishment, miasma (bad air)
11. How did people try to prevent the Black Death?	Praying, Keep air moving, Flagellants

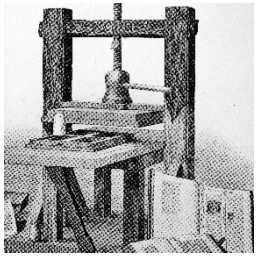
The Black Death in 1348

History - Paper 1: Medicine Through time, c.1250-Present Day + Medicine in the Trenches 1914-1918

Key Topic 2: What was medicine like in the Early Modern Period, c.1500-1700?

Key words	
Dissection	Cutting up a corpse to study the internal organs and structure.
Anatomy	The study of the human body
Privy / latrine / water closets	A toilet, usually a public or shared one.
Almshouse / poor house	Charitable housing provided to vulnerable people in the community, run by church or set up by wealthy benefactors.
Renaissance	Re-birth; a period of time where people return to questioning and scientific experienments
Printing Press	Invented in 1440, but impact felt in Renaissance period. Took control of information out of the Church's control, and allowed for new ideas to be shared.

Page from Vesalius' book The Fabric of the Human Body



The Printing Press

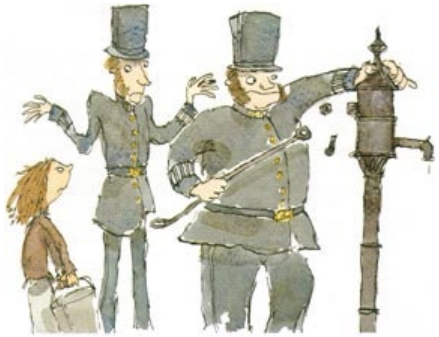
Core knowledge	
12. What treatments did people still use in the Renaissance period?	Bloodletting and purging, praying, herbal remedies
13. How did Vesalius prove Galen wrong in more than 200 ways?	Learnt about anatomy from dissections
14. Why was Thomas Sydenham known as the English Hippocrates?	Emphasised careful observation. Each disease was different.
15. Who discovered that blood is pumped around the body by the heart?	William Harvey
16. Why were his theories slow to be accepted?	No evidence (needed microscope), power of the Church
17. What did Gutenberg invent?	Printing press
18. What did Leeunwenhoek invent?	Microscope
19. What group included scientists who discussed and experimented?	Royal Society
20. When was the Great Plague?	1665
21. How did people try to prevent the Great Plague?	Praying, Quarantine, Dogs and cats killed, Amber burnt on streets

History - PAPER 1: Medicine Through time, c.1250-Present Day + Medicine in the Trenches 1914-1918

Key Topic 3: What was medicine like in the 18TH AND 19TH Centuries, c.1700-1900?

Key words	
Industrial Revolution	The period c.1750-1900 which saw new machines and technology that led to mass production and increase in population in towns.
Laissez-Faire	The point of view of the government in the 1700-mid 1800s. They did not interfere in people's lives or health.
Smallpox	A viral disease that causes disfiguring blisters leaving scars. To some vulnerable people it can be fatal
Sanitation	The provision of clean water, with waste being kept separate.
Amputation	Surgical removal of a limb
Cauterise	Following amputation the wound would be burned to seal it
Antiseptics	Chemicals that kill bacteria and prevent infection
Industrial Revolution	The period c.1750-1900 which saw new machines and technology that led to mass production and increase in population in towns.

Florence Nightingale



Core knowledge	
22. What did Edward Jenner invent?	Smallpox vaccine
23. What did people believe caused disease before Germ Theory was published?	Spontaneous Generation of germs
24. Whose theory was germs cause disease?	Louis Pasteur, 1861
25. What vaccines were discovered as a result of Pasteur's and Koch's work?	Rabies, typhoid, tuberculosis, diphtheria, tetanus
26. What did Florence Nightingale do?	Cleaned up hospitals. Reduced death rate from infection from 40% to 2%.
27. What did John Snow discover?	Source of cholera outbreak in 1854. (Broad Street pump)
28. Why did the government pass the 1875 Public Health Act?	Report: Conditions in working class areas were terrible
29. What did Edwin Chadwick publish in 1842?	Voting reforms, the Great Stink, Germ Theory
30. What were the 3 biggest problems in surgery at the beginning of the 19th Century?	Pain, infection and blood loss
31. What 3 methods were used to try and deal with pain in surgery?	Ether, laughing gas and chloroform
32. What did Joseph Lister develop?	Using carbolic acid spray as an anti-septic.
33. Who discovered DNA's structure?	Crick and Watson
34. Which three reports established the link between poverty and poor health?	Chadwick, Booth and Rowntree

History - PAPER 1: Medicine Through time, c.1250-Present Day + Medicine in the Trenches 1914-1918

Key Topic 4: What is medicine like in the Modern Period, c.1900-Present Day?

Key words	
Magic bullet	A chemical / synthetic / man-made drug that targets and kills disease-microbes
Alternative therapies	Medical treatments not involving drugs e.g. acupuncture
Transfusion	Transferring blood from a donor to a recipient (person receiving the donated blood)
Genetic screening	The study of a person's DNA sequence in order to identify susceptibility to particular diseases
Stem cell research	Stems cells are extracted from human embryos and can be grown to repair faulty cells in a patients body, but the embryo dies.
Gangrene / sepsis	Death of body tissue due to lack of blood flow or serious bacterial infection
Magic bullet	A chemical / synthetic / man-made drug that targets and kills disease-microbes
Alternative therapies	Medical treatments not involving drugs e.g. acupuncture

Salverson 606 Magic Bullet

X-Rays, new technology of the modern period

NHS healthy living campaign poster

Core knowledge	
35. Give two examples of technology that has led to improved diagnosis.	Endoscopes, microscopes, scans, nuclear medicine
36. What did Alexander Fleming discover in 1928?	Penicillin
37. When did Florey and Chain begin working on penicillin?	1938
38. Why did the government begin funding mass production of penicillin?	Second World War
39. What did Paul Erlich discover?	Salvarson 606 – the first magic bullet
40. What were the Liberal Reforms?	Laws passed by the Liberal government (1906-1914) aimed to improve the lives of ordinary people
41. What did the Beveridge Report call for?	A National Health Service (NHS), 1948
42. Give three examples of high-tech medical treatments.	Blood transfusions, X-rays, radiotherapy, transplants, gene therapy, dialysis, keyhole surgery, pacemakers.
43. What attempts have been made to prevent lung cancer?	Advertising campaigns and anti-smoking laws.

History - PAPER 1: Medicine Through time, c.1250-Present Day + Medicine in the Trenches 1914-1918

Key Topic 5: DEPTH STUDY: What is medicine like in the British sector of the Western Front, 1914-1918?

Key words	
Front	An edge or boarder; Western Front where the trenches were and the opposing sides fought
Salient	A piece of land or section of fortification that sticks out to form an angle e.g. the Ypres Salient
Sodium citrate	A chemical added to donated blood to stop it clotting
Citrate glucose	A chemical added to donated blood so it can be stored for longer
Blood depot	A blood bank / storage facility for donated blood
Gas gangrene	When a wound is infected the skin swells and a foul-smelling gas is released when the wound is treated
Sterile	A germ free environment
Pedicle tubes	Tubes made from a patient's skin tissue whilst still attached to the body. Stitched onto a wound helping the body to heal itself and avoid infection

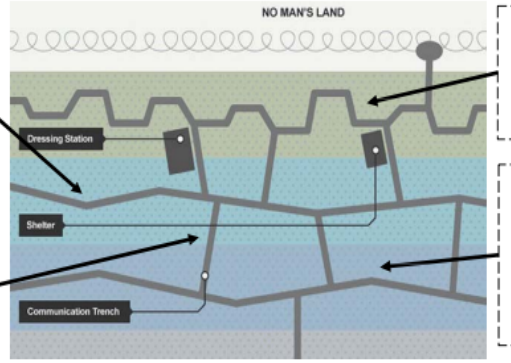
Core knowledge	
44. What were the tunnels used for at the Battle of Arras?	Underground hospital
45. How many British casualties were there on the first day of the Battle of the Somme?	60,000
46. What were three of the main illnesses suffered in the trenches?	Trench foot, Trench fever, Shell shock
47. What was the effect of shrapnel?	Infection due to dirty terrain
48. What happened at the Regimental First Aid Post?	Wounded were triaged
49. What was the FANY?	First Aid Nursing Yeomanry
50. Why had blood transfusions often been unsuccessful before the First World War?	Didn't know different blood groups, couldn't store blood

History - PAPER 1: Medicine Through time, c.1250-Present Day + Medicine in the Trenches 1914-1918

Key Topic 5: DEPTH STUDY: What is medicine like in the British sector of the Western? Front, 1914-1918?

The Trench System

This shows the main features of the Trench System from the Western Front, they were often quite different but they were mostly laid out this way. No Man's Land was between the two trenches, punctuated by shell holes, death and destruction.



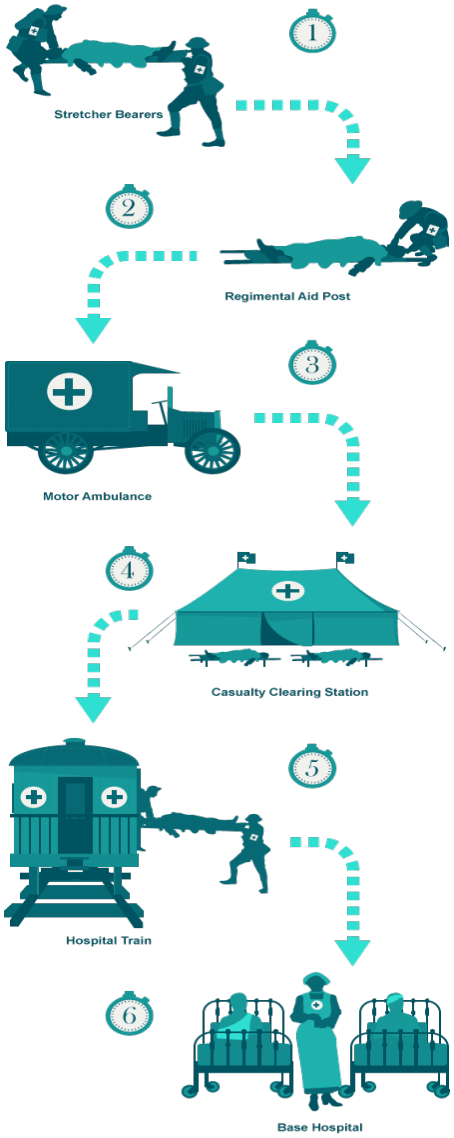
Support Trench
80m behind the frontline trench. Troops would retreat here if under attack. 10% of time here.

Communications Trench
Trenches that run between other trenches, linking them together.

Frontline Trench
Where attacks were made from, the most dangerous area. Only 15% of a soldiers time was here.

Reserve Trench
100m behind the support trench. Where troops would be mobilised to counter attack the enemy if they captured the front line. 30% of time here.

45% of a soldiers time was actually spent away from the trenches.



1. RAP: Regimental Aid Post

- Located within 200 metres of the frontline, in communication trenches.
- The purpose of the RAP was to give immediate first aid and get as many men back to the front as quickly as possible. They could not deal with serious injuries – these were sent to ADS.
- Led by a Regimental Medical Officer with some stretcher bearers.

2. Dressing stations (ADS and MDS)

- There was usually an **Advanced Dressing Station** (ADS) within 400m of the RAP and a **Main Dressing Station (MDS)** about half a mile away, usually in tents or bunker to provide protection from enemy shelling. They could only look after men for a week.
- They were staffed by 10 medical officers, stretcher bearers and nurses too.

In total, they could deal with about 150 men but often in battles like Ypres (1917) they dealt with 1,000 causalities in 2 days at Hooge.

3.Casualty Clearing Stations (CCS)

- Around 7 miles away from the front, close to the railway and for ambulance wagons.
- They had several doctors, contained operating theatres, x-ray machines and wards. They could deal with up to 1,000 casualties at a time. At the Third Battle of Ypres the 24 CCS treated over 200,000 causalities with only 4% dying.
- The CCS treated the most critical injuries close to the front. This was important as it would stop gangrene infection and so men could be sent back to the front.
- The CCS had a triage system to assess the wounded into three categories:
  - The walking wounded - patch them up and send back to the front.
  - Those in need of hospital treatment - move to a Base Hospital.
  - No chance of recover y- make them comfortable.

4. Base Hospitals

- Situated near the ports on the French/Belgian coast on trainlines and canals.
- They had operating theatres, x-ray machines, laboratories and even specialist centres for treating gas poisoning and head wounds. These specialist wards allowed doctors to become experts in treatment of particular wounds.
- They could treat upto 2,500 patients at once.
- From here, most patients were sent back to England, those with '*Blighty Wounds*'.

Hospitality and Catering

Key Words	Definitions
Ambience	the feel of a place- décor, friendliness etc.
Ambient temperature	room temperature (37 degrees centigrade)
Barista	person who makes coffee
Beverage	drink
Bonus	extra money for working
Buying in bulk	ordering a lot of produce in order to get it cheaper e.g. a sack of flour instead of little bags
Catering	providing food and drink
Chain	several establishments with the same name owned by the same person
Chef de partie-	chef of a food section e.g. sauce or fish
Climate change	changes in the planet's temperature from burning fossil fuels
Commercial	a business that is run for profit
Communicator	someone who can talk to people and be understood
Condiment	sauce such as mayonnaise, mustard or ketchup
Contract	written agreement in law
Consortium	a group of cooperating companies, could be different brand names
COSHH	Control Of Substances Hazardous to Health
Counter service	cafeteria, fast food, take away, buffet
Critical limit	how much level of risk is acceptable

Key Words	Definitions
Danger zone-	5°c-63°c. Where bacteria multiply quickest
Demographics	who your customers are and what they like/need
Domestic manager	another name for head housekeeper
Due diligence	taking all precautions
EHO	environmental health officer (food safety, NOT recycling)
Employee	someone with an employment contract
Employer	someone who hires staff
En suite	Rooms that have a bath/shower/toilet attached to them
EPOS	electronic point of sale- keeps cash and orders accurate
Establishment	A hospitality or catering business
Facility	something that makes life easier or better e.g. pool
Farm to fork	food that can be traced back through all stages of farming or making
Food miles	the distance food is transported from the farm. Uses fossil fuels.
Food provenance	knowing where food comes from
Fossil fuels	coal, oil, gas. Release greenhouse gas when burnt
Greenhouse gasses	cause global warming. Carbon dioxide from food miles, or methane from animal farming and waste food.

Key Words	Definitions
HACCP	Hazard Analysis Critical Control Point- a plan to stop food poisoning
HASAWA	Health and Safety At Work Act
Hospitality	looking after people. Providing a service that includes accommodation, food and drink
Hot holding	keeping food at 63°c or above for a maximum of 2 hours
Impulse buying-	buying something when you didn't go in to buy that thing
Initiative	doing things without being asked to
Justify	say why it is good
King size	large double bed (and bedroom)
Landfill	rubbish including food and packaging when dumped
Locally sourced	from nearby farms, saves on food miles
Management	responsibility for other employees and an area of the business
MHOR	Manual Handling Operations Regulations
Nausea	feeling sick
Non-commercial	not operated for profit
Non-residential	an establishment such as a restaurant that does not provide beds to its guests
Outlet	Multi establishment organisations may refer to its individual establishments as outlets

Hospitality and Catering

Key Words	Definitions
PPER	Personal Protective Equipment Regulations
Permanent	forever
Propose	give suggestions
Provision	food or accommodation
Punctual	on time for work
Remuneration	pay, tips, and bonuses for working
Residential	business that provides a bed e.g. hotel
RIDDOR	Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
Salary	money paid for work, usually over a year
SeasonaL	fresh food grown in the UK
Seasonal/ casual worker	person employed only at busy times
Section	area of the kitchen where one thing is made e.g. desserts
Section chef	chef de partie
Service	how food is served to the customer e.g. counter or plate
Sommelier	waiter in charge of wine
Sous chef	second in command
Suite	hotel bedroom with living room attached
Sustainable diet	diet based on plants which has a minimal environmental impact. Saves on food miles and greenhouse gasses from animal farming.

Key Words	Definitions
Table service	plate service, family service, silver service, gueridon
Target customer	who you are providing beds/food/drink for
Toxic	poisonous
Toxin	poison
Tray service	room service, hospitals
Trolley service	planes, room service, gueridon
Turnover	the amount of product sold or provided to customer
Valet	parks your car
Venue	location where an event takes place
Worker	someone hired without a contract

Music - The Delta blues

1. Key Words	Definitions
4/4	This is a time signature. This indicates that there are 4 beats in a bar (specifically crotchet beats).
Shuffle	A type of rhythm that uses triplets
Triplets	This is where you fit three notes into the space of two
Aurally	When something is passed on verbally and by word-of-mouth
Blues Scale	A scale is a selection of notes. The Blues scale uses six notes and the third note in the scale is flattened (moved down a semitone)
AAB	A structure where section A is repeated twice, followed by a brand-new section (B).
Blues Notes	Flattened 3rds, 5ths and 7ths. These notes are called worried notes
12 Bar Blues	A 12-bar chord sequence that include three different chords
Walking Bass Line	Repetitive bass line that creates a groove
Groove	Rhythms together that create another rhythm that moves the music
Syncopation	Off-the beat. Where the weaker beat is stressed and emphasised
Solo	A solo is where one person plays on their own, or a part by themselves over the top of a harmony
Call and Response	Originating from African Drumming, the call is played by one person and the rest of the ensemble then respond with a different rhythm
Improvisation	Where something is made up on the spot
Boogie Woogie	A repetitive swung or shuffle rhythm
Reverb	When something has an echo-like effect

2. Context

The Delta Blues originated in the deep south of the USA in the 1870s. It developed from African work songs and spirituals during the slave trade period.

Many different types of blues developed: Chicago blues, Delta blues, Dallas blues, blues rock etc.

This further influenced the development of rock and roll and pop music.

3. Composers, artists or producers

Robert Johnson

Robert Johnson was a legendary Blues musician known for his haunting vocals and intricate guitar playing. His influential style, characterised by the Delta Blues, showcased his mastery of slide guitar and heartfelt lyrics.

B.B. King

Often referred to as the 'King of the Blues', he had a distinctive guitar style marked by his expressive vibrato and precise phrasing. His soulful voice and iconic guitar solos, combined with elements of jazz and R&B, created a unique sound that captivated audiences worldwide.

4. Key Features

Distribution & sharing	• Sun Records – Small independent label • Performed at small venues
Rhythm & rhythmic techniques	• Strong rhythms • Frantic, energetic vocals • Heavy use of the snare drum • Boogie Woogie style piano • Fast tempo
Recording techniques & developments	• Slap back echo • Flutter echo • Tape delay echo • Reverb
Production	• Use of the tape echo.
Melodic techniques	• Vocal twangs • Driving guitar licks
Instruments (timbre)	• Electric guitar • Double Bass • Drums – minimal drum kit – bass, snare and ride cymbal • Piano • Vocals
Instrument techniques	• Bass Slap • Finger picking used in the guitar parts
Harmony	• I-IV-V chord progressions (12-bar blues) • 7th chords used a lot to provide detail.

Music - Britpop

1. Key Words	Definitions
Arpeggios	A chord that is broken up into separate notes that are played one after the other
4/4	A time signature that symbolises it has 4 crotchet beats per bar
Melody	In music this is often referred to as the main tune.
Riff	A repetitive, short catchy phrase of music
Strophic Structure	A structure that uses song sections – such as verse, chorus, bridge etc.
Palm Muting	Where you soften the notes of the guitar using the palm of your hand
Seventh Chord	Where you add the seventh note of the scale onto the chord (e.g. C major 7 would be: C, E, G and B)
Sus Chord	A sus chord is where you play the second or the fourth note in the scale instead of the third
Grunge	A genre of music that came in the mid-80s and was known for its heavy distortion and down-tuned rock music. Nirvana was a famous grunge band
British Invasion	A cultural movement where rock and pop music acts from the UK took over the music industry in both the UK and the US
Alternative Rock	A genre of music that emerged from the independent music underground in the 1970s and became hugely popular in the 1990s

2. Context

Britpop emerged from the British Invasion of Music in the mid 90s. Britpop originated from the UK and the music emphasised 'brightness'. It was a form of alternative rock and was a reaction against the darker lyrics of Grunge (such as Nirvana). It further influenced styles such as Cool Britannia and guitar pop.

There was an infamous chart battle between Oasis and Blur in 1995 – The Battle of Britpop. Tony Blair and New Labour aligned themselves with the movement. Britpop declined in 1997 due to the popularity of the Spice Girls. Britpop was known as a cultural movement and not just a musical genre. It was influenced by Glam Rock, British Pop of the 60s, Punk Rock and Indie Pop of the 80s. Blur and Oasis were inspired by The Kinks, early Pink Floyd and The Beatles. The Smiths also influenced a lot of Britpop acts.

3. Composers, artists or producers

Oasis

Led by the Gallagher brothers, Liam and Noel, they were the kings of Britpop. Oasis had raw energy and a rebellious attitude that made them stand out. Some of their most famous songs are Wonderwall and Don't Look Back in Anger.

Blur

Led by Damon Albarn, they delivered catchy hits like "Song 2" and "Parklife." Their music embodied the spirit of British culture and left a significant impact on the music scene.

4. Key Features

Distribution & sharing	• Media driven focus on bands • Independent music scene
Production	• Clean guitar sounds. • Overdrive used heavily as well • Limited distortion was used as this was a feature of Grunge who they were trying to get away from
Rhythmic techniques	• 4/4 time signature • Up tempo and upbeat
Scales & modes	• The use of arpeggios in the riffs • Use of the pentatonic scale in lead lines
Structure	• Typical song structure with instrumentals, bridges and solos were often very common
Instruments & timbre	• Vocals • Electric Guitar • Bass Guitar • Acoustic Guitar • Drums • Keyboards (used sometimes) • Piano • String arrangements used sometimes
Instrumental techniques & developments	• Use of hammer-ons • Use of pull-offs • Use of palm muting on guitars • Use of pitch bending on guitars • Use of string skipping on guitars

Religious Studies - Theme D

1. Key vocabulary

Conflict	Dispute between sides, can be between individuals, groups or nations.
Forgiveness	Letting go of blame against a person for wrongs they have done; moving on.
Holy War	War that is believed to be sanctioned by God.
Justice	Bringing fairness back to a situation.
Just War	Set of rules for fighting a war in a way believed to be justified and acceptable to God.
Nuclear Deterrence	Having nuclear weapons with the aim of deterring/preventing other states attacking for fear of retaliation and nuclear war (possibly leading to Mutually Assured Destruction).
Nuclear Weapons/War	A weapon of mass destruction which causes widespread damage and loss of life. Nuclear war would be a war fought using these weapons.
Pacifism	Belief that all violence is wrong, which then affects all behaviours.
Peace	The opposite of war; harmony between all in society.
Peace making	Working to bring about peace and reconciliation.
Protest	A statement or action to express disagreement; can be an organised event to demonstrate disagreement with a policy or political action.
Reconciliation	Making up and rebuilding relationships between two groups/sides after disagreement.
Retaliation	To pay someone back for their harmful actions.
Terrorism	Use of violence and threats to intimidate others; used for political purposes to build fear in the ordinary population and to secure demands from Government.
Victims of War	Those who are harmed during a war, for example those killed, injured or left homeless.
Violence	Behaviour involving physical force which intends to hurt, kill or cause damage.
War	Armed conflict between two or more sides.
Weapons of Mass Destruction	Weapons which cause widespread, indiscriminate damage (e.g. nuclear, chemical, biological).

2. Key quotes

Justice	'Do not let hatred of others lead you away from justice, but adhere to justice' – Qur'an
Forgiveness	'I tell you not seven times, but seventy-seven times' – Bible 'ask forgiveness of God: He is most forgiving and merciful' – Qur'an
Reconciliation	'Love your enemies and pray for those that persecute you' - Bible
Violence/ Terrorism	'Thou shalt not kill' – Ten Commandments 'Whoever kills a human is as if he has killed the whole of mankind' – Qur'an
Justification for War	'Those who have been attacked are permitted to take up arms because they have been wronged' – Qur'an 'To anyone who fights in God's way, whether killed or victorious, We shall give a great reward' – Qur'an 'Defend the weak and the fatherless; uphold the cause of the poor and the oppressed' – Bible
Pacifism	'Blessed are the peacemakers, for they will be called children of God' - Bible 'For all those who draw the sword will dies by the sword' – Bible 'You have heard that it was said, 'Eye for eye, and tooth for tooth,' But I tell you, do not resist an evil person. If anyone slaps you on the right cheek, turn to them the other cheek also' – Bible 'We have finished the Lesser Jihad, let us now focus on the Greater Jihad' – Hadith
WMD	'Do not repay anyone evil for evil' – Bible 'Do not contribute to your own destruction with your own hands, but do good, for God loves those who do good' – Qur'an

Religious Studies - Theme E

1. Key vocabulary

Addiction	Being addicted to/dependent on a particular substance; can be a cause of crime (e.g. stealing money to pay for illegal drugs).
Community Service	Punishment involving the criminal doing a set number of hours of physical labour/work in their local community.
Corporal Punishment	Punishment in which physical pain is inflicted on the criminal.
Crime	Action which breaks the law; can be against the person (e.g. murder), against property (e.g. vandalism), or against the state (e.g. treason).
Death Penalty	Capital punishment; the execution of a criminal which is sanctioned by the state.
Deterrence	Aim of punishment; the threat of punishment as a way to put a person off committing crime (e.g. knowing they could go to prison if they steal).
Evil Intentions	Having the desire to deliberately cause suffering or harm to another.
Forgiveness	Letting go of blame against a person for wrongs they have done; moving on.
Greed	Reason for committing crime – wanting or desiring something or more of something.
Hate Crime	A crime committed because of prejudiced views about a person or group.
Prison	Imprisonment is a form of punishment where a criminal is locked in a secure guarded building (prison) for a period of time.
Law	The rules a country demands its citizens follow, the breaking of which leads to punishment.
Mental Illness	A medical condition that can cause changes to a person's behaviour; can be a cause of crime.
Murder	Unlawfully killing another person.
Poverty	The state of being without the things needed for a reasonable quality of life; can be a cause of crime.
Principle of Utility	The concept of acting out of the greater good for the most people. (e.g. removing a dangerous criminal from society in order to protect others).
Reformation	Aim of punishment; helping the criminal see how and why their behaviour was wrong, so that their mindset changes for the better.
Retribution	Aim of punishment; getting the criminal back for their crimes.
Sanctity of Life	Belief that life is sacred/special because it was created by God, or because we are each a unique individual.
Theft	Taking something without the owner's consent.
Unjust Law	A legal requirement within a society that is believed to be unfair; a cause of crime if a person believes they cannot follow (or must act against) a law they believe is unjust.
Upbringing	The environment a child lives in, and the instructions they receive, while they are growing up; can be a cause of crime.

2. Key quotes

Capital Punishment	'Thou shalt not kill' – Bible 'Take not life except by way of justice and law' – Qur'an 'But if there is harm, then you shall pay life for life, eye for eye, tooth for tooth, hand for hand, foot for foot, burn for burn, wound for wound, stripe for stripe.' - Bible
Obeying the law	'Let everyone be subject to the governing authorities, for there is no authority except that which God has established' - Bible
Helping victims of crime	'Love thy neighbour' - Bible
Treatment of Criminals	'I was in prison, and you visited me' – Bible 'Pray for those who persecute you' – Bible 'Forgive us our sins as we forgive those who sin against us' – Lord's Payer
Forgiveness	'I tell you not seven times, but seventy-seven times' – Bible 'Ask forgiveness of God: He is most forgiving and merciful' – Qur'an
Corporal Punishment	'A thief male and female cut off the hand of both' – Qur'an 'If a woman or man is guilty of adultery, flog each of them 100 stripes' – Qur'an

Performing Arts - Responding to a Brief

1. What can I expect from Component 3?

This external component builds on knowledge, understanding and skills acquired and developed in Components 1 and 2 and includes synoptic assessment.

Learners will apply their skills and techniques creatively to devise a performance piece for a selected audience.

Learners will capture their ideas on planning, development and effectiveness of the production process in a written log and an evaluation report.

2. Assessment Objectives

AO1 Understand how to respond to a brief

AO2 Select and develop skills and techniques in response to a brief.

AO3 Apply skills and techniques in a workshop performance in response to a brief

AO4 Evaluate the development process and outcome in response to a brief

3. Vocal Skills

Clarity	How clearly you speak.
Pause and Pace	Speed or speech and moments of pause between words and/or sentences.
Inflection	Changes in speech whilst talking e.g. pitch rising at the end of a sentence.
Pitch	The particular level of a voice, e.g. high or low.
Tone	The emotional sound of the voice.
Accent	A distinctive way of pronouncing language, associated with a particular area, country or social class.
Timbre	The distinctive 'character' or quality of a voice.

4. Physical Skills

Facial Expression	The use of the face to convey emotion.
Body Language	How you communicate feeling through the actions of your body.
Gesture	A movement, usually with the hand, arms or head that communicates something.
Gait	How your character walks.
Posture	The position in which someone holds their body when standing or sitting.
Proxemics	The position of characters on stage in relation to other characters and the meaning this communicates.
Mannerism	A peculiarity of speech, movement or behaviour.

5. Key Words

5. Key Words	Definitions
Stimulus	The starting point to provide inspiration and ideas for devising a drama performance.
Explorative Strategies	A technique to explore and deepen understanding of the drama you create.
Plot Development	The organisation of building of the action in a play.
Target Audience	Who you will choose to aim your performance at.
Improvisation	Live theatre in which the events/ dialogue, characters are made up in the moment.
Still Image	Where the action on stage freezes to 'mark a moment'.
Theatre In Education	Drama that is created for a specific target audience in order to educate around a certain topic.
Verbatim	Verbatim theatre is a form of documentary theatre which is based on the actual spoken words of real people.

6. Links & Further Reading

Devising Strategies
https://www.bbc.co.uk/bitesize/topics/z4vm2sg

Building blocks for Devising
https:// www.youtube.com/watch?v=gUqZPfGIX6U

Devising Process National Theatre
https://www.youtube.com/watch?v=7mJ02mSvbEM

PSHE – My Body, My Choice

1. Key Terms	Description
Consent	Permission for something to happen or agreeing to do something
Choice	The act of choosing between two or more possibilities. Making a decision based of thoughts and feelings.
Contraception	A method of preventing pregnancy and the spread of Sexually Transmitted Infections
Abortion	A termination of human pregnancy, most often performed within the first 28 weeks of pregnancy.
Healthy Relationship	A relationship that contains many positive characteristics where all included people are happy, safe and comfortable.
Unhealthy Relationship	A relationship where one or more people are unhappy or at risk of danger or harm. A relationship that contains negative or "toxic" traits.
Self-Worth	The level of confidence in one's own worth or abilities.
Self-Belief	Someone's level of belief that they have the ability to achieve goals and complete tasks. Capability of reaching success.

2. Recognising and Seeking Consent

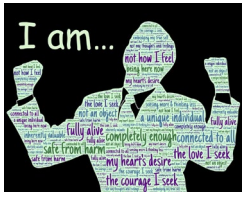
Consent remains the most important factor of positive sexual relations and it is important we understand how to recognise it and know how we are able to seek it. To recognise consent, it is important to know that consent must be enthusiastic. All involved people must maintain enthusiastic consent. This is recommended to be verbal, however, could also be communicated through writing, body language and gestures. Communication is key when it comes to consent. Be open, honest and clear with each other and ensure you are all happy with upcoming events. Communication will help you to seek consent too. Asking your partner whether they are ready will open up a conversation to determine your readiness. It is also important to recognise when consent is not being given, such as if someone appears to be distancing themselves, they seem unsure in their speech and if they continually make excuses when it comes to talking about progressions in the relationship. This lack of consent should not then be forced or manipulated.

4. Healthy vs Unhealthy Relationships

We hope for all relationships to be healthy, but the reality is that this is not the case. A relationship would be deemed healthy should everyone involved feel safe and comfortable when present with the other. An unhealthy relationship would include one side of the relationship acting as if they had power over the other and made them feel uncomfortable and unnerved. Spotting the signs of an unhealthy relationship could help preventing them from developing and this could help us to maintain positive relationships moving forwards.

3. The Law around Abortion

In England, Scotland and Wales, abortion is considered legal, should it meet the criteria in the Abortion Act 1967. Should these criteria not be met, abortion is considered a crime. In summary, the criteria of the Abortion Act 1967 include it being lawfully registered in an NHS facility by a registered practitioner; it occurs before the pregnancy exceeds the 24th week and a continued pregnancy would involve risk greater than the abortion itself; continuing the pregnancy could increase the risk of harm to the pregnant person or if the child is at risk of severe physical or mental abnormalities.



5. Self-Worth and Self-Belief

As we grow as individuals, it is important for our own health that we honour our own self-worth and empower this with self-belief. Loving the person you are and believing in yourself will enable you to be confident enough to build positive relationships with others and also be strong enough to expect the highest standard of treatment towards yourself, not allowing someone to overpower you in a relationship which could result in you finding yourself in positions that could rapidly deteriorate both your physical and mental health.

6. Links to External Support

BROOK
www.brook.org.uk
0808 802 1234

Childline
www.childline.org.uk
0800 1111

Barnardo's
www.barnardos.org.uk

NHS
www.nhs.uk

Spanish

1. Talking about the present

¿Qué haces?	What do you do?
Debo	I must
Puedo	I can
Quiero	I want
Tengo	I have
Tiene	He / she has
Tengo que + infinitive	I have to + verb
Soy	I am
Es	It is
Me gusta(n)	I like
Le gusta(n)	He / she likes
Prefiero	I prefer
prefiere	He / she prefers
Voy	I go / I am going
Va	He/she goes / is going
¿Cuándo?	
Por la mañana	In the morning
Los lunes	On Mondays
El fin de semana	At the weekend
En invierno	In winter
a veces	Sometimes
a menudo	Often
en seguida	Straight away

2. Talking about the past

¿Qué hiciste?	What did you do?
fui	I went
Fue /era	it was
vi	I saw
tuve	I had
hice	I did
lo pasé bomba	I had a blast
lo pasé mal	I had a bad time
me divertí	I had fun
había	There was/were
Hice	I did
solía	I tended to
Tenía que	I had to
¿Cuándo?	
El verano pasado	Last summer
El mes pasado	Last month
La semana pasada	Last week
Ayer	Yesterday
Anteayer	The day before yesterday
Hace dos días	Two days ago

3. Talking about the future

¿Qué harás?	What will you do?
Iré	I will go
Veré	I will see
Será	It will be
Voy a + infinitive	I am going to + verb
Va a + inf	He / she is going to + verb
Vamos a + inf	We are going to+ verb
Me gustaría + inf	I would like to+ verb
Le gustaría + inf	He/she would like to
Espero + inf	I hope to + verb
Tengo la intención de + inf	I intend to + verb
Mi sueño es de + inf	My dream is to + verb
Tendré que	I will have to
Se debería + infintive	One should + verb
¿Cuándo?	
La semana que viene	Next week
El próximo año	Next year
Cuando sea mayor	When I am older
Cuando tenga 18 años	When I am 18
Pasado mañana	The day after tomorrow
Mañana	Tomorrow
¿Qué harás?	What will you do?

4. Connectives

También	Also
Además	In addition
asimismo	Also / likewise
De hecho	In fact
Sobre todo	Above all
Por un lado / por otro lado	On one hand/ on the other hand
Sin embargo	However
Al contrario	On the contrary
No obstante	However
Aunque	Although
Ya que / dado que	Because
Por eso	Because of this
Así que	So / therefore
Uncommon vocabulary	
Es pan comido	It's easy peasy
Duro	Difficult / tough
Te tomo el pelo	I'm pulling your leg
soso	Dull / boring
apasionante	Thrilling
Me importa un rábano	I couldn't care less

Spanish

1. Theme 1 – key terms

Ser	To be
Tener	To have
apoyar	To support
conocer	To meet/ know
juzgar	To judge
casarse	To get married
pelearse	To fight
llevarse bien/mal	To get on well/ badly
Jugar (al)	To play (ball sport)
Tocar	To play (instrument)
Escuchar música	To listen to music
Ver una película	To watch a film
Descargar	To download
Leer libros	To read books
Celebrar	To celebrate
Subir	Upload
Sacar fotos	To take photos
Mandar mensajes	To send messages
Las redes sociales	Social networks
Los riesgos	The risks
Una página web	A webpage
Una canción	A song
Ser	To be

2. Theme 2 – key terms

viajar	To travel
descansar	To relax
quedarse	To stay
beber	To drink
visitar	To visit
tomar el sol	To sunbathe
comprar	To buy
ir de compras	To go shopping
salir	To leave/ to go out
tomar el sol	To sunbathe
pasar	To spend (time)
volver	To return
España	Spain
las Islas Canarias	The Canary Islands
En avión	By plane
En coche	By car
En barco	By boat/ferry
a pie	On foot
Perdí ...	I lost/ missed
el vuelo	The flight
mi pasaporte	My passport
mi maleta	My suitcase

3. Theme 2 – key terms

Vivir	To live
En el campo	In the countryside
En la ciudad	In the city
En las afueras	On the outskirts
Una ventaja	An advantage
Un inconveniente	A disadvantage
Un mercado	A market
Un Puerto	A port
Una biblioteca	A library
Una tienda	A shop
Una plaza	A (town) square
un billete	A ticket
Nada / Mucho que hacer	Nothing /Lots to do
Enfrente de	Opposite
Al lado de	Near to
Lejos de	Far from
Cerca de	Near to
Vivir	To live
En el campo	In the countryside
En la ciudad	In the city
En las afueras	On the outskirts
Una ventaja	An advantage
Un inconveniente	A disadvantage

4. Theme 3 – key terms

aprender	To learn
Estudiar	To study
Llevar uniforme	To wear uniform
Llegar	To arrive
Empezar	To start
Terminar	To finish
Escribir	To write
Ser puntual	To be on time
Comer chicle	To chew gum
Sacar buenas notas	To get good grades
Aprobar un examen	To pass an exam
Suspender un examen	To fail an exam
El acoso escolar	Bullying
Un intercambio escolar	A school exchange
Una visita escolar	A school trip
Participar	To take part
aprender	To learn
Gritar	To shout
aprender	To learn
Estudiar	To study
Llevar uniforme	To wear uniform
Llegar	To arrive
Empezar	To start

Spanish

5. Theme 5 – key terms

La Copa Mundial	The World Cup
Promover	To promote
Elevar	To raise
Unir a la gente	To unite the people
Animar	To Encourage
(No) se debería	One should (not)
Apagar la luz	To turn off the light
Separar	To separate
El vidrio	Glass
Usar bolsas de plástico	To use plastic bags
El paisaje	The landscape
Los árboles	Trees
Amenazar	To threaten
Apoyar	To support
ayudar	To help
Causar	To cause
Cuidar	To look after
Preocupar	To worry
Proteger	To protect
tirar	To throw (away)
El mayor problema	The biggest problem
La pobreza	Poverty
La salud	Health

6. Describing a picture

Describe la foto	Describe the photo
Hay	There is / are
Veo / Puedo ver	I see / I can see
Lleva / llevan	He/she wears / they are wearing
Está / están	He/ she is / they are
hablando, jugando	Talking, playing
sonriendo, leyendo, viendo	smiling, reading, watching,
En el salón / el campo	In the lounge / countryside
En la ciudad / oficina	In the town / office
En el fondo	In the background
En primer plano	In the foreground
A la izquierda	On the left
A la derecha	On the right
Hace calor / sol	It is hot / sunny
Hay niebla	It is foggy
Llueve	It is raining
Nieva	It is snowing
Un hombre	A man
Una mujer	A woman
Un chico/a	A boy / girl
Un niño/a	A child
Unas personas	Some people

7. Key structures

Superlatives	
lo bueno	the good thing
lo malo	the bad thing
lo mejor	the best thing
lo peor	the worst thing
Just add the conditional – I would	
Si fuera posible	If it were possible
Si fuera rico/a	If I were rich
Si tuviera mucho dinero	If I had a lot of money
Si pudiera	If I could
Si viviera allí	If I lived there
Exclamations	
¡Qué pena!	What a shame!
¡Qué lástima!	What a pity!
¡Qué rollo!	What a drag!
Una pérdida de tiempo	A waste of time
Key adverbs	
Bastante	quite
demasiado	too
Poco	barely
Un poco	A bit

8. Speaking Success Criteria

Role Play /10 marks

Relevant to the scenario
Clear communication
! Answer unknown question
? Ask the teacher a question
No need to develop / extend your answer
Use question words and intonation

Picture card /24 marks

DOPFO – order of bullet points
Description, opinion, past, future, opinion
PALMW – describe the picture
People, action, location, mood, weather
Rule of 3 – develop your answer
Opinion, reason, contrasting opinion

General conversation / 36 marks
Your introduction – max. 1 minute
Opinion, reason, contrast
3 past and future tense verbs
Varied vocab and connectives
Comparative, negative, superlative
Conversation questions
Rule of 3 – develop your answer
Use the past, present and future tenses
Use time phrases (last week etc.)

Writing Success Criteria

80-90 words (Higher and Foundation)

4 clear paragraphs
Present, opinion, past, future bullet points
Rule of 4
Use time phrases, varied vocab, connectives, I, she/he, we verb forms, comparative, superlative, negation
130-150 words (Higher only)

As 80-90 words BUT
Rule of 5
High level structures
Idioms

Components of Physical Fitness

Flexibility
The range of movement possible at a joint

Aerobic Endurance
Ability of heart and lungs to supply oxygen to the working muscles

Body Composition
The percentage of body weight that is muscle, fat or bone

Muscular Endurance
The ability of a muscle or muscle group to undergo repeated contractions avoiding fatigue

Muscular Strength
The ability to overcome a resistance

Speed
The rate at which an athlete can perform a movement or cover a distance

A1 COMPONENTS OF FITNESS

Components of Skill-Related Fitness

Coordination
The ability to use two or more body parts together at the same time

Power
The ability to undertake strength performances quickly
Power = Strength x Speed

Agility
The ability to move and change direction quickly whilst maintaining control

Reaction Time
The time taken to initiate a response to a stimulus

Balance
Maintenance of the centre of mass over the base of support

The FITT Principle is used to identify the basic principles of training

Frequency	How often training takes place
Intensity	How 'hard' training is
Time	How long training lasts
Type	What type of training is used

Additional Principles of Training

1. Progressive Overload
2. Specificity
3. Individual Differences
4. Adaptation
5. Reversibility
6. Variation
7. Rest & Recovery

Progressive Overload
- This means gradually increasing the amount of overload during training in order to improve fitness but without injury
- If you increase the intensity of your workouts gradually you will make steady improvements

Reversibility
- This means gradually losing fitness and occurs to anybody who stops training

Reasons for Reversibility:
- Injury
- Demotivation
- Off-Season
- Illness
- Fatigue

A2 PRINCIPLES OF TRAINING

Adaptaton
- This is about how your body changes due to increased training loads.

Specificity
- This means matching training to the requirements of an activity
- Different sports and different positions require athletes to use different training methods in order to reach their potential

Individual Differences
- The needs of an individual could alter due to their fitness level, weight, gender or previous injuries

Variation
- You can avoid boredom and maintain motivation to train by altering the types of training.

Rest & Recovery
- This is very important during an exercise programme and without adequate rest, injury or burnout become likely

Training Thresholds are based on **Heart Rate** and are set to make sure that people train at an effective but safe level.

Aerobic Training Threshold → 65-85% of Max HR

Anaerobic Training Threshold → 85-95% of Max HR

Maximum Heart Rate = 220 - Age

Aerobic Training Example

Max HR: 220 - 25 = 195 Beats per Min.

Working out the aerobic training threshold of a 25 year old runner

Aerobic training zone = 65-85% of Max HR

65% of 195 = 127

85% of 195 =167

Therefore Aerobic Training Threshold = 127-167 Beats per Min

Weight Training - Calculating Repetition Maximums

- 1 Rep Max. (RM) = the heaviest amount you can lift in one repetition.
- 15 Rep Max. (RM) = the heaviest amount you can lift and repeat 15 times.

1 RM is for strength
15 RM is for muscular endurance

A3 DETERMINING EXERCISE INTENSITY

The Borg Rating of Perceived Exertion Scale

Perceived exertion is how hard you feel like your body is working.

Rating of Perceived Exertion Borg RPE Scale		
6 7 8 9 10 11	Very, very light Very light Fairly light	How you feel when lying in bed or sitting in a chair relaxed. Little or no effort.
12 13 14 15 16	Somewhat hard Hard	Target range: how you should feel with exercise or activity
17 18 19 20	Very hard Very, very hard Maximum exertion	How you felt with the hardest work you have ever done Dont work this hard!

RPE can be used to estimate heart rate (HR), using the equation:
RPE x 10 = HR

Manually taking pulse rate

Smart Watches

Measuring Exercise Intensity

Heart Rate Monitors

Apps

thepeclassroom.com

Design training programmes based on test results

Goal setting aims

Reasons for Fitness Testing

Determine if training programmes are working

Give a performer something to aim for

Baseline data for monitoring/ improving performance

Factors Affecting Practicality:

- Cost
- Time taken to perform the test
- Time taken to set up the test
- Time taken to analyse data
- Number of participants that can take part in the test at any time.

B1 Importance of Fitness Testing

Pre fitness test check

Complete informed consent

Pre-Test Procedures

Calibration of equipment

Complete PAR-Q

Fitness tests must be:

- Reliable
- Valid
- Specific
- Compared against data

Factors Affecting Reliability of Fitness Tests:

- Calibration of equipment
- Motivation of the participant
- Conditions of the testing environment (inside versus outside conditions)
- Experience of the person administering the test
- Compliance with standardised test procedure.

thepeclassroom.com