



Year 11
Learning Cycle 2
Preparing for Assessment

Student Name: _____

Instructions on how to use your learning cycle book



At Poltair we **SORT** it!

The aim is for all students to be fully prepared and ready for all assessments in all subjects.

To help them with this we have a whole school revision/study strategy - SORT.

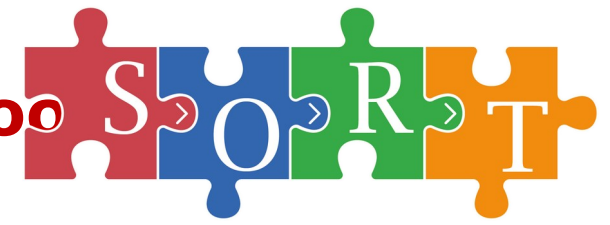
There are three learning cycles throughout Year 11. At the beginning of each learning cycle students will be issued with a booklet that details all the knowledge they are expected to know and recall by the end of the learning cycle.

Each day, for home learning, students are set two activities that support in memorising and recalling this key knowledge.

The assessment window for Learning Cycle 2 (PPE2) will be 27th February - 10th March

Summarise	Organise	Recall	Test
Summarise and condense any class notes, revision guides and revision.	Organise 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.	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			
<ul style="list-style-type: none"> • Cornell Notes • Flash cards • Mind mapping • Revision clocks • Dual coding 	<ul style="list-style-type: none"> • How to use your PLC • How to schedule your home learning and stick to it! 	<ul style="list-style-type: none"> • Look cover & test • Leitner system • Blurt it • Transform it 	<ul style="list-style-type: none"> • Low stakes • Self-quizzing • Quiz each other • Online quizzes • High stakes • Exam style questions

Instructions on how to use your learning cycle book



Learning cycle 2 will focus on the SORT strategies:

At Poltair we SORT it!

S ummarise	O rganise	R ecall	T est
<ul style="list-style-type: none">• Cornell Notes• Flash cards• Mind mapping	<ul style="list-style-type: none">• How to use your PLC• How to schedule your home learning and stick to it!	<ul style="list-style-type: none">• Look cover & test• Leitner system• Blurt it	<ul style="list-style-type: none">• Self-quizzing• Quiz each other• Online quizzes

Using the Personal Learning Checklists (PLC)

- Review each key idea on the PLC
- In the **O**rganise column write R, A or G depending on your understanding. **Red** = no understanding, **Amber** = Some understanding but needs work, **Green** - Secure understanding
- When you complete a **S**ummarise activity for each key idea, tick the S column
- When you complete a **R**ecall activity for each key idea, tick the R column
- When you **T**est by self-quizzing or complete an online-quiz for each key idea, tick the T column

Videos explaining all of the SORT strategies can be found on the Student SharePoint

Homework timetable

	Mon A	Tue A	Wed A	Thu A	Fri A
Core activity	Complete Maths goal	Complete Maths goal	Complete Maths goal	Complete Maths goal	Complete Maths goal
Subject 1	Science	English	Science	English	Option B
Subject 2	Option C	Option D	Maths	Option A	Independent revision using the knowledge organisers
	Mon B	Tue B	Wed B	Thu B	Fri B
Core activity	Complete Maths goal	Complete Maths goal	Complete Maths goal	Complete Maths goal	Complete Maths goal
Subject 1	Science	English	Science	English	Option B
Subject 2	Option C	Option D	Maths	Option A	Independent revision using the knowledge organisers

My computer passwords

Platform	User Name	Password
School system		
Complete Maths		
Educake		
Memrise		

#revise50

REVISE FOR 50

Record every 15 minutes that you revise. You are aiming to complete a minimum of 50 hours ahead of your PPEs. This can include time spent in planned revision sessions or independent study.

#revise50

1	11	21	31	41
2	12	22	32	42
3	13	23	33	43
4	14	24	34	44
5	15	25	35	45
6	16	26	36	46
7	17	27	37	47
8	18	28	38	48
9	19	29	39	49
10	20	30	40	50

Year 11 Learning Cycle 1 Personal Learning Check lists

English Literature: Romeo and Juliet

Key Ideas	S	O	R	T
I understand the key plot points in the play.				
I understand the significant characters in the play and their characterisation.				
I can explain how the they themes are presented in the play.				
I can recall a range of relevant quotations and references to support the points I am making.				
I can link ideas about Elizabethan context to my analysis of Shakespeare's ideas and quotations.				
I can analyse Shakespeare's language methods.				
I can analyse features of structure and form used by Shakespeare.				
I can plan an extended, critical response to Romeo and Juliet.				
I can write a thesis driven essay on the play.				

English Literature: A Christmas Carol

Key Ideas	S	O	R	T
I understand the key plot points in the novella.				
I understand the significant characters in the novella and their characterisation.				
I can explain how the they themes are presented in the novella.				
I can recall a range of relevant quotations and references to support the points I am making.				
I can link ideas about Victorian context to my analysis of Dickens' ideas and quotations.				
I can analyse Dickens' language methods.				
I can analyse features of structure and form used by Dickens.				
I can plan an extended, critical response to A Christmas Carol.				
I can write a thesis driven essay on the novella.				

English Literature: An Inspector Calls

Key Ideas	S	O	R	T
I understand the key plot points in the play.				
I understand the significant characters in the play and their characterisation.				
I can explain how the they themes are presented in the play.				
I can recall a range of relevant quotations and references to support the points I am making.				
I can link ideas about Edwardian context to my analysis of Priestley's ideas and quotations.				
I can analyse Priestley's language methods.				
I can analyse features of structure and form used by Priestley.				
I can plan an extended, critical response to An Inspector Calls.				
I can write a thesis driven essay on the play.				

Year 11 Learning Cycle 1 Personal Learning Check lists

English Literature: Power and Conflict Poems

Key Ideas	S	O	R	T
I can analyse the key meanings, language, tone, imagery and structure in Ozymandias.				
I can analyse the key meanings, language, tone, imagery and structure in London.				
I can analyse the key meanings, language, tone, imagery and structure in The Prelude.				
I can analyse the key meanings, language, tone, imagery and structure in My Last Duchess.				
I can analyse the key meanings, language, tone, imagery and structure in The Charge of the Light Brigade.				
I can analyse the key meanings, language, tone, imagery and structure in Exposure.				
I can analyse the key meanings, language, tone, imagery and structure in Storm on the Island.				
I can analyse the key meanings, language, tone, imagery and structure in Bayonet Charge.				
I can analyse the key meanings, language, tone, imagery and structure in Remains.				
I can analyse the key meanings, language, tone, imagery and structure in Poppies.				
I can analyse the key meanings, language, tone, imagery and structure in War Photographer.				

English Literature: Power and Conflict Poems

Key Ideas	S	O	R	T
I can analyse the key meanings, language, tone, imagery and structure in Tissue.				
I can analyse the key meanings, language, tone, imagery and structure in The Emigree.				
I can analyse the key meanings, language, tone, imagery and structure in Checking Out Me History.				
I can analyse the key meanings, language, tone, imagery and structure in Kamikaze.				
I can plan and write an extended comparison and analysis of two poems from the Anthology.				
I can link relevant context and poet's intentions to my analysis of quotations.				

English Literature: Unseen Poetry

Key Ideas	S	O	R	T
I understand how to approach an unseen poetry analysis.				
I can analyse key meanings and ideas in a poem I have never read before.				
I can analyse language, tone, imagery and structure in a poem I have never read before.				
I can compare and analyse the methods used by two poets.				

English Language: Paper 1

Key Ideas	S	O	R	T
Q1 - I can select relevant information from a fiction text.				
Q2 - I can identify and analyse important language methods used by a fiction writer.				
Q3 - I can identify and analyse important structure methods used by a fiction writer.				
Q4 - I can evaluate a statement about a fiction text.				
Q4 - I can support an evaluation of a fiction text by identifying and analysing a range of relevant methods.				
Q5 - I can plan an extended descriptive or narrative piece of writing.				
Q5 - I can use a range of sophisticated vocabulary precisely in my creative writing.				
Q5 - I can use a range of language methods in my creative writing.				
Q5 - I can use a range of structure methods in my creative writing.				
Q5 - I can use a range of punctuation accurately in my creative writing.				
Q5 - I can use a range of sentence structures and starters in my creative writing.				
Q5 - I can proof-read and edit my creative writing.				

Year 11 Learning Cycle 1 Personal Learning Check lists

English Language: Paper 2, Section 2

Key Ideas	S	O	R	T
Q1 - I can select statements that are true about a non-fiction text.				
Q2 - I can summarise how two writers present a subject and make inferences about their ideas.				
Q3 - I can identify and analyse important language methods used by a fiction writer.				
Q4 - I can compare two writers' viewpoints and the methods they used to convey them.				
Q4 - I can analyse the methods used by two writers to present their views.				
Q5 - I can plan an extended piece of persuasive or discursive writing.				
Q5 - I can use a range of sophisticated vocabulary precisely in my non-fiction writing.				
Q5 - I can use a range of language methods in my non-fiction writing.				
Q5 - I can use a range of structure methods in my non-fiction writing.				
Q5 - I can use a range of punctuation accurately in my non-fiction writing.				
Q5 - I can use a range of sentence structures and starters in my non-fiction writing.				
Q5 - I can proof-read and edit my non-fiction writing.				

Year 11 Learning Cycle 2 Science Personal learning Checklists - Paper 2 Biology

Unit	Key Idea	S	O	R	T
4.5.1 Homeostasis	Describe what homeostasis is and why it is important stating specific examples from the human body				
	Describe the common features of all control systems				
4.5.2 The human nervous system	State the function of the nervous system and name its important components				
	Describe how information passes through the nervous system				
	Describe what happens in a reflex action and why reflex actions are important				
	Explain how features of the nervous system are adapted to their function, including a reflex arc (inc all types of neuron and the synapse)				
	<i>Required practical 7: plan and carry out an investigation into the effect of a factor on human reaction time</i>				
	<i>Bio ONLY: State the function of the brain and how it is structured, including identifying the cerebral cortex, cerebellum and medulla on a diagram of the brain</i>				
	<i>Bio ONLY: Describe the functions of different regions of the brain</i>				
	Bio & HT ONLY: Explain how neuroscientists have been able to map regions of the brain to particular functions				
	<i>Bio ONLY: State the function of the eye and how it is structured, including names of specific parts</i>				
	<i>Bio ONLY: Describe the functions of different parts of the eye, including relating structure to function</i>				

Unit	Key Idea	S	O	R	T
4.5.3 Hormonal coordination in humans	Describe the endocrine system, including the location of the pituitary, pancreas, thyroid, adrenal gland, ovary and testis and the role of hormones				
	State that blood glucose concentration is monitored and controlled by the pancreas				
	Describe the body's response when blood glucose concentration is too high				
	Explain what type 1 and type 2 diabetes are and how they are treated				
	HT ONLY: Describe the body's response when blood glucose concentration is too low				
	HT ONLY: Explain how glucagon interacts with insulin to control blood glucose levels in the body				
	Describe how water, ions and urea are lost from the body				
	Describe the consequences of losing or gaining too much water for body cells				
	HT ONLY: Recall that protein digestion leads to excess amino acids inside the body and describe what happens to these				
	Describe how the kidneys produce urine				
	HT ONLY: Describe the effect of ADH on the permeability of the kidney tubules and explain how the water level in the body is controlled by ADH				
	Describe how kidney failure can be treated by organ transplant or dialysis and recall the basic principles of dialysis				

Year 11 Learning Cycle 2 Science Personal learning Checklists - Paper 2 Biology

Unit	Key Idea	S	O	R	T
4.6.1 Reproduction	Describe features of sexual and asexual reproduction				
	Describe what happens during meiosis and compare to mitosis				
	Describe what happens at fertilisation				
	<i>Bio ONLY: Explain advantages of sexual and asexual reproduction</i>				
	<i>Bio ONLY: Describe examples of organisms that reproduce both sexually and asexually (malarial parasites, fungi, strawberry plants and daffodils)</i>				
	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)				
	<i>Bio ONLY: Describe the structure of DNA, including knowledge of nucleotide units</i>				
	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				

Unit		S	O	R	T
4.6.2 Variation and evolution	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				
	<i>Bio ONLY: Describe different cloning techniques, to include: tissue culture, cuttings, embryo transplants and adult cell cloning</i>				

Year 11 Learning Cycle 2 Science Personal learning Checklists - Paper 2 Biology

Unit	Key Idea	S	O	R	T
4.6.3 The development of understanding of genetics and evolution	<i>Bio ONLY: Describe the ideas proposed by Darwin in his theory of natural selection and explain why this theory was only gradually accepted</i>				
	<i>Bio ONLY: Describe other inheritance-based theories that existed (apart from the theory of natural selection), and the problems with these theories</i>				

Unit	Key Idea	S	O	R	T
4.7.3 Biodiversity and the effect of human interaction on ecosystems	Describe what biodiversity is, why it is important, and how human activities affect it				
	Describe the impact of human population growth and increased living standards on resource use and waste production				
	Explain how pollution can occur, and the impacts of pollution				
	Describe how humans reduce the amount of land available for other animals and plants				
	Explain the consequences of peat bog destruction				
	Describe what deforestation is and why it has occurred in tropical areas				
	Explain the consequences of deforestation				
	Describe how the composition of the atmosphere is changing, and the impact of this on global warming				
	Describe some biological consequences of global warming				
	Describe both positive and negative human interactions in an ecosystem and explain their impact on biodiversity				
	Describe programmes that aim to reduce the negative effects of humans on ecosystems and biodiversity				

Unit	Key Idea	S	O	R	T
4.7.4 Trophic levels in an ecosystem	<i>Bio ONLY: Describe the different trophic levels and use numbers and names to represent them</i>				

Unit	Key Idea	S	O	R	T
4.7.5 Food production	<i>Bio ONLY: Explain the term 'food security' and describe biological factors that threaten it</i>				
	<i>Bio ONLY: Explain how the efficiency of food production can be improved</i>				
	<i>Bio ONLY: Explain the term 'factory farming', including examples, and ethical objections</i>				
	<i>Bio ONLY: Explain the importance of maintaining fish stocks at a level where breeding continues</i>				
	<i>Bio ONLY: Explain some methods that can help to conserve fish stocks</i>				
	<i>Bio ONLY: Describe how modern biotechnology is used in food production, including the fungus Fusarium as an example</i>				
	<i>Bio ONLY: Describe the uses of genetically modified organisms in insulin and food production</i>				
	<i>Bio ONLY: Explain the term 'food security' and describe biological factors that threaten it</i>				
	<i>Bio ONLY: Explain how the efficiency of food production can be improved</i>				
	<i>Bio ONLY: Explain the term 'factory farming', including examples, and ethical objections</i>				

Year 11 Learning Cycle 2 Science Personal learning Checklists - Paper 2 Chemistry

Unit	Key Idea	S	O	R	T
4.6.1 Rate of reaction	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, cm ³ /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				
	HT ONLY: Calculate the gradient of a tangent to the curve on the graph of the quantity of product formed or reactant used against time and use this 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 5: 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, including discussing activation energy				
	Describe the role of a catalyst in a chemical reaction and state that enzymes are catalysts in biological systems				
	Draw and interpret reaction profiles for catalysed reactions				
4.6.2 Reversible reactions and dynamic equilibrium	Explain what a reversible reaction is, including how the direction can be changed and represent it using symbols: $A + B \rightleftharpoons C + D$				
	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				

Unit	Key Idea	S	O	R	T
4.7.1 Carbon compounds as fuels and feedstock	Describe what crude oil is and where it comes from, including the basic composition of crude oil and the general chemical formula for the alkanes				
	State the names of the first four members of the alkanes and recognise substances as alkanes from their formulae				
	Describe the process of fractional distillation, state the names and uses of fuels that are produced from crude oil by fractional distillation				
	Describe trends in the properties of hydrocarbons, including boiling point, viscosity and flammability and explain how their properties influence how they are used as fuels				
	Describe and write balanced chemical equations for the complete combustion of hydrocarbon fuels				
	Describe the process of cracking and state that the products of cracking include alkanes and alkenes and describe the test for alkenes				
	Balance chemical equations as examples of cracking when given the formulae of the reactants and products				
	Explain why cracking is useful and why modern life depends on the uses of hydrocarbons				
4.7.2 Reactions of alkenes and alcohols	<i>Chem ONLY: State the names and draw structural formulae of the first four members of the alkenes and recognise substances as alkenes from their formulae</i>				
	<i>Chem ONLY: Describe the basic composition of alkenes, including the C=C functional group, the general chemical formula for the alkenes and describe what unsaturated means</i>				
	<i>Chem ONLY: Describe the combustion reactions of alkenes and the reactions of alkenes with hydrogen, water and the halogens</i>				
	<i>Chem ONLY: Draw fully displayed structural formulae of the first four members of the alkenes and the products of their addition reactions with hydrogen, water, chlorine, bromine and iodine</i>				
	<i>Chem ONLY: State the functional group of alcohols and the first four members of the homologous series of alcohols and represent alcohols using formulae</i>				

Year 11 Learning Cycle 2 Science Personal learning Checklists - Paper 2 Chemistry

Unit	Key Idea	S	O	R	T
4.7.1 Carbon compounds as fuels and feedstock	Describe what crude oil is and where it comes from, including the basic composition of crude oil and the general chemical formula for the alkanes				
4.7.3 Synthetic and naturally occurring polymers	<i>Chem ONLY: Describe how alkenes can be used to make polymers by addition polymerisation</i>				
	<i>Chem ONLY: Identify addition polymers and monomers from diagrams and from the presence of the functional group and draw diagrams to represent the formation of an addition polymers</i>				
	Chem & HT ONLY: Describe the process of condensation polymerisation and explain the basic principles of condensation polymerisation				
	Chem & HT ONLY: State that amino acids have two different functional groups in a molecule and they react by condensation polymerisation to produce polypeptides				
	Chem & HT ONLY: Explain that different amino acids can be combined in a chain to produce proteins				
4.7.3 Synthetic and naturally occurring polymers	<i>Chem ONLY: Describe DNA as a large molecule of two polymer chains made from four different monomers called nucleotides in the form of a double helix</i>				
	<i>Chem ONLY: State and describe some other naturally occurring polymers such as proteins, starch and cellulose</i>				
	<i>Chem ONLY: Describe how alkenes can be used to make polymers by addition polymerisation</i>				
	<i>Chem ONLY: Identify addition polymers and monomers from diagrams and from the presence of the functional group and draw diagrams to represent the formation of an addition polymers</i>				
	Chem & HT ONLY: Describe the process of condensation polymerisation and explain the basic principles of condensation polymerisation				
	Chem & HT ONLY: State that amino acids have two different functional groups in a molecule and they react by condensation polymerisation to produce polypeptides				
	Chem & HT ONLY: Explain that different amino acids can be combined in a chain to produce proteins				

Unit	Key Idea	S	O	R	T
4.8.1 Purity, formulation s and chromatograph & 4.8.2 ID of gases	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 R _f value of a compound represents, how the R _f value differs in different solvents and interpret and determine R _f 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 R_f values)				
	Explain how to test for the presence of hydrogen, oxygen, carbon dioxide and chlorine				
4.8.3 Identification of ions by chemical and spectroscopic means	<i>Chem ONLY: Identify some metal ions from the results of flame tests and describe how to conduct a flame test</i>				
	<i>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</i>				
	<i>Chem ONLY: Write balanced equations for the reactions between sodium hydroxide solution and some metal ions to produce insoluble hydroxides</i>				
	<i>Chem ONLY: Describe how to identify carbonates using limewater</i>				
	<i>Chem ONLY: Describe how to identify negative ions, including halide ions using silver nitrate and sulfate ions using barium chloride</i>				
	Required practical 7: use of chemical tests to identify the ions in unknown single ionic compounds				
	<i>Chem ONLY: State the advantages of using instrumental methods to identify elements and compounds compared to chemical tests</i>				

Year 11 Learning Cycle 2 Science Personal learning Checklists - Paper 2 Physics

Unit	Key Idea	S	O	R	T
4.6.1 Waves in air, fluids and solids	Describe waves as either transverse or longitudinal, defining these waves in terms of the direction of their oscillation and energy transfer and giving examples of each				
	Define waves as transfers of energy from one place to another, carrying information				
	Define amplitude, wavelength, frequency, period and wave speed and Identify them where appropriate on diagrams				
	State examples of methods of measuring wave speeds in different media and Identify the suitability of apparatus of measuring frequency and wavelength				
	Calculate wave speed, frequency or wavelength by applying, but not recalling, the equation: $v = f\lambda$ and calculate wave period by recalling and applying the equation: $T = 1/f$				
	Identify amplitude and wavelength from given diagrams				
	Describe a method to measure the speed of sound waves in air				
	Describe a method to measure the speed of ripples on a water surface				
	<i>PHY ONLY: Demonstrate how changes in velocity, frequency and wavelength are inter-related in the transmission of sound waves from one medium to another</i>				
	Required practical 8: make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank and waves in a solid				
	<i>PHY ONLY: Discuss the importance of understanding both mechanical and electromagnetic waves by giving examples, such as designing comfortable and safe structures and technologies</i>				
	<i>PHY ONLY: Describe a wave's ability to be reflected, absorbed or transmitted at the boundary between two different materials</i>				

Unit	Key Idea	S	O	R	T
4.6.2 Electromagnetic waves	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				
	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				
	<i>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</i>				

Year 11 Learning Cycle 2 Science Personal learning Checklists - Paper 2 Physics

Unit	Key Idea	S	O	R	T
4.6.2 Electromag netic waves	<i>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</i>				
	<i>PHY ONLY: Construct ray diagrams for both convex and concave lenses</i>				
	<i>PHY ONLY: Calculate magnification as a ratio with no units by applying, but not recalling, the formula: [magnification = image height / object height]</i>				
	<i>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</i>				
	<i>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</i>				
	<i>PHY ONLY: Explain why an opaque object has a particular colour, with reference to the wavelengths emitted</i>				
	<i>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</i>				
	<i>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</i>				
	<i>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</i>				
	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					
<i>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</i>					

Unit	Key Idea	S	O	R	T
4.7.1 Permanent and induced magnetism, magnetic forces and fields	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				
4.7.2 The motor effect	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)				
	<i>PHY ONLY: Interpret diagrams of electromagnetic devices in order to explain how they work</i>				
	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					
4.7.3 Induced potential, transformers and the National Grid	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.				

Year 11 Learning Cycle 2 Science Personal learning Checklists - Paper 2 Physics

Unit	Key Idea	S	O	R	T
4.9.1 The composition and evolution of the Earth's atmosphere	Describe the composition of gases in the Earth's atmosphere using percentages, fractions or ratios				
	Describe how early intense volcanic activity may have helped form the early atmosphere and how the oceans formed				
	Explain why the levels of carbon dioxide in the atmosphere changes as the oceans were formed				
	State the approximate time in Earth's history when algae started producing oxygen and describe the effects of a gradually increasing oxygen level				
	Explain the ways that atmospheric carbon dioxide levels decreased				
4.9.2 Carbon dioxide and methane as greenhouse gases	Name some greenhouse gases and describe how they cause an increase in Earth's temperature				
	List some human activities that produce greenhouse gases				
	Evaluate arguments for and against the idea that human activities cause a rise in temperature that results in global climate change				
	State some potential side effects of global climate change, including discussing scale, risk and environmental implications				
	Define the term carbon footprint and list some actions that could reduce the carbon footprint				
4.9.3 Common atmospheric pollutants and their sources	Describe the combustion of fuels as a major source of atmospheric pollutants and name the different gases that are released when a fuel is burned				
	Predict the products of combustion of a fuel given appropriate information about the composition of the fuel and the conditions in which it is used				
	Describe the properties and effects of carbon				

Year 11 Learning Cycle 2 Mathematics Higher Personal learning Checklists

Grade	Key Idea	S	O	R	T
9	Approximate solutions to equations using iteration.				
9	Equation of a circle				
9	Equation of a tangent				
8	Algebra and Proof				
8	Gradients and area under a graph				
8	Graphs of trigonometric functions				
8	Quadratic equations (completing the square)				
7	Composite functions				
7	Expand the product of two or more binomials				
7	Factorising difficult quadratic expressions				
7	Geometric Sequences				
7	Graphs of exponential functions				
7	Quadratic equations (needing re-arrangement)				
7	Quadratic equations (quadratic formula)				
7	Real-life exponential graphs				
7	Represent quadratic inequalities				
7	Simultaneous equations (nonlinear)				
7	Solve quadratic inequalities				
7	Translations and reflections of a function				
7	Turning points & completing the square				
6	Algebraic fractions				
6	Identifying parallel lines				
6	Inverse functions				
6	Linear inequalities in two variables				
6	nth term of a quadratic sequence				
6	Quadratic equations (factorisation)				

Grade	Key Idea	S	O	R	T
6	Quadratic equations (graphical methods)				
6	Represent linear inequalities				
6	Simultaneous equations (linear)				
5	Algebraic argument				
5	Algebraic terminology				
5	Cubic and Reciprocal graphs				
5	Deduce quadratic roots algebraically				
5	Derive an equation				
5	Equation of a line				
5	Expand the product of two binomials				
5	Factorising quadratic expressions				
5	Fibonacci, quadratic and simple geometric sequences				
5	Graphical solution to equations				
5	Inequalities on number lines				
5	Linear equations				
5	Quadratic graphs				
5	Reciprocal real-life graphs				
5	Simplify indices				
5	Simplify surds				
5	Solve linear inequalities in one variable				
5	Writing formulae and expressions				
4	Changing the subject				
4	Collecting like terms				
4	Expressions				
4	Factorise single bracket				
4	Finding the equation of a line				
4	Graphs of linear functions				
4	Graphs of quadratic functions				
4	Linear equations one unknown				
4	Multiplying single brackets				
4	Non-standard real life graphs				
4	nth term of a linear sequence				
4	Number machines				
4	Substitution				
4	Using "y = mx + c"				

Grade	Key Idea	S	O	R	T
8	Surds				
7	Index Laws (negative and fractional)				
7	Product rule				
7	Recurring Decimals				
7	Upper and lower bounds				
6	Finance 1				
6	Powers and Roots				
6	Product of prime factors				
6	Using Pi				
5	Calculating with fractions				
5	Error intervals				
5	Index Laws				
5	Limits of accuracy				
4	Adding and subtracting fractions				
4	Checking calculations				
4	Compound measures				
4	Converting metric units				
4	Estimation				
4	Fractions and percentages				
4	Fractions and ratio problems				
4	Interpret calculator displays				
4	LCM and HCF				
4	Multiples and factors				
4	Multiplying fractions				
4	Operations				
4	Order of operations				
4	Powers				
4	Rounding				
4	Standard Form				

Year 11 Learning Cycle 2 Mathematics Higher Personal learning Checklists

Grade	Key Idea	S	O	R	T
8	Circle theorems				
8	Vector arguments and proof				
7	Area of a triangle				
7	Cosine Rule				
7	Pythagoras and trig 2D and 3D				
7	Sine Rule				
6	Combined transformations				
6	Congruence and Similarity				
6	Standard trigonometric ratios				
5	Arc lengths and sectors				
5	Derive triangle results				
5	Enlargements and negative SF				
5	Loci				
5	Pythagoras				
5	Similarity and Congruence				
5	Standard constructions				
5	Surface Area				
5	Trigonometric ratios				
5	Volume				
4	Alternate and corresponding angles				
4	Area of a circle				
4	Areas of composite shapes				
4	Areas of triangles, trapezia and parallelograms				
4	Bearings				
4	Circle terminology				
4	Circumference of a circle				
4	Congruent triangles				
4	Enlargements and fractional SF				
4	Perimeter of 2D shapes				
4	Plans and elevations				
4	Polygons				
4	Solve geometrical problems				
4	Vector arithmetic				
4	Volume of prisms				

Grade	Key Idea	S	O	R	T
9	Gradients and the rate of change				
7	General iterative processes				
6	Direct and inverse proportion				
5	Compound Units				
5	Gradient & the rate of change				
5	Growth and decay				
5	Interpret Proportion				
5	Percentage change				
5	Problems with compound units				
5	Scale factors and similarity				
5	Simple Interest and Financial Maths				
5	Solve Proportion Problems				
4	Compare Fractions, Decimals and Percentages				
4	Compare lengths, area, volume				
4	Comparing quantities as a ratio				
4	Division of a quantity as a ratio				
4	Express one quantity as a % of another				
4	Percentage change				
4	Problems involving ratio				
4	Proportion and ratio				
4	Ratio and fractions				
4	Ratio Sharing				

Grade	Key Idea	S	O	R	T
6	Boxplots				
6	Cumulative frequency				
6	Histograms with unequal class widths				
6	Quartiles and Interquartile Range				
5	Histograms with equal class widths				
5	Scatter graphs				
4	Comparing data using graphs				
4	Comparing Distributions				
4	Correlation				
4	Population				
4	Sampling				
4	Scatter Diagrams				
4	Time series				

Grade	Key Idea	S	O	R	T
7	Conditional Probability				
5	Probability of dependent events				
5	Probability of independent events				
4	Mutually exclusive sum				
4	Relative Frequency				
4	Tables and Grids				
4	Theoretical Probability				
4	Unbiased Samples				
4	Venn Diagrams				

Year 11 Learning Cycle 2 Mathematics Foundation Personal learning Checklists

Grade	Key Idea	S	O	R	T
5	Algebraic terminology				
5	Cubic and Reciprocal graphs				
5	Deduce quadratic roots algebraically				
5	Derive an equation				
5	Equation of a line				
5	Expand the product of two binomials				
5	Factorising quadratic expressions				
5	Fibonacci, quadratic and simple geometric sequences				
5	Graphical solution to equations				
5	Inequalities on number lines				
5	Linear equations				
5	Quadratic graphs				
5	Reciprocal real-life graphs				
5	Simplify indices				
5	Simplify surds				
5	Solve linear inequalities in one variable				
5	Writing formulae and expressions				
4	Changing the subject				
4	Collecting like terms				
4	Expressions				
4	Factorise single bracket				
4	Finding the equation of a line				
4	Graphs of linear functions				
4	Graphs of quadratic functions				
4	Linear equations one unknown				
4	Multiplying single brackets				
4	Non-standard real life graphs				
4	n th term of a linear sequence				
4	Number machines				
4	Substitution				
4	Using " $y = mx + c$ "				
3	Coordinates in four quadrants				
3	Plotting straight line graphs				
3	Position to term rules				
3	Sequences of square, triangular and cube numbers				
3	Using Formulae				
2	Sequences and Rules				

Grade	Key Idea	S	O	R	T
5	Calculating with fractions				
5	Error intervals				
5	Index Laws				
5	Limits of accuracy				
4	Adding and subtracting fractions				
4	Checking calculations				
4	Compound measures				
4	Converting metric units				
4	Estimation				
4	Fractions and percentages				
4	Fractions and ratio problems				
4	Interpret calculator displays				
4	LCM and HCF				
4	Multiples and factors				
4	Multiplying fractions				
4	Operations				
4	Order of operations				
4	Powers				
4	Rounding				
4	Standard Form				
4	Terminating decimals and fractions				
3	Decimals				
3	Listing outcomes				
3	Prime numbers				
3	Using standard units				
2	Add and Subtract integers				
2	Dividing integers				
2	Multiplying integers				
2	Ordering numbers				
2	Place value				

Grade	Key Idea	S	O	R	T
5	Arc lengths and sectors				
5	Derive triangle results				
5	Enlargements and negative SF				
5	Loci				
5	Pythagoras				
5	Similarity and Congruence				
5	Standard constructions				
5	Surface Area				
5	Trigonometric ratios				
5	Volume				
4	Alternate and corresponding angles				
4	Area of a circle				
4	Areas of composite shapes				
4	Areas of triangles, trapezia and parallelograms				
4	Bearings				
4	Circle terminology				
4	Circumference of a circle				
4	Congruent triangles				
4	Enlargements and fractional SF				
4	Perimeter of 2D shapes				
4	Plans and elevations				
4	Polygons				
4	Solve geometrical problems				
4	Vector arithmetic				
4	Volume of prisms				
3	3-D Shapes				
3	Congruent and similar shapes				
3	Geometrical terminology and diagrams				
3	Measuring lines and angles				
3	Properties of quadrilaterals				
3	Properties of triangles				
3	Translations and vectors				
3	Using standard units				

Year 11 Learning Cycle 2 Mathematics Foundation Personal learning Checklists

Grade	Key Idea	S	O	R	T
5	Compound Units				
5	Gradient & the rate of change				
5	Growth and decay				
5	Interpret Proportion				
5	Percentage change				
5	Problems with compound units				
5	Scale factors and similarity				
5	Simple Interest and Financial Maths				
5	Solve Proportion Problems				
4	Compare Fractions, Decimals and Percentages				
4	Compare lengths, area, volume				
4	Comparing quantities as a ratio				
4	Division of a quantity as a ratio				
4	Express one quantity as a % of another				
4	Percentage change				
4	Problems involving ratio				
4	Proportion and ratio				
4	Ratio and fractions				
4	Ratio Sharing				
3	Convert standard units				
3	Express one quantity as a fraction of another				
3	Use ratio notation				
3	Use scale factors, diagrams and maps				

Grade	Key Idea	S	O	R	T
5	Histograms with equal class widths				
5	Scatter graphs				
4	Comparing data using graphs				
4	Comparing Distributions				
4	Correlation				
4	Population				
4	Sampling				
4	Scatter Diagrams				
4	Time series				
3	Charts and Diagrams				
3	Pie Charts				
3	Types of data				
3	Vertical Line Charts				

Grade	Key Idea	S	O	R	T
5	Probability of dependent events				
5	Probability of independent events				
4	Mutually exclusive sum				
4	Relative Frequency				
4	Tables and Grids				
4	Theoretical Probability				
4	Unbiased Samples				
4	Venn Diagrams				
3	Frequency Trees				
3	Probability of equally likely outcomes				

Year 11 Learning Cycle 2 Personal Learning Check lists

Geograph

Key Ideas	S	O	R	T
Explain the different types of erosion (hydraulic action, abrasion, attrition)				
Explain how material is transported by longshore drift				
Explain how erosion landforms are formed (headlands, bays, cliffs, wave cut platforms, caves, arches, stacks)				
Explain how deposition landforms are formed				
Evaluate the costs and benefits of soft and hard engineering methods				
Describe the characteristics of a long profile and changing cross profiles of a river and its valley				
Identify the different landforms which result from erosion and deposition processes and describe their characteristics				
Explain how erosion landforms are formed (interlocking spurs, waterfalls, gorges)				
Explain how deposition landforms are formed (levees, flood plains, estuaries)				
Explain how physical and human factors affect the flood risk (precipitation, geology, relief and land use)				
Evaluate the costs and benefits of hard engineering methods				
Evaluate the costs and benefits of soft engineering methods				

Histor

Key Ideas	S	O	R	T
I can explain how lawlessness increased in the West				
I can explain the significance of Little Crow's War				
I can explain how the White Americans took over more of the Plains				
I can explain the significance of the Battle of Little Big Horn				
I can explain the Ghost Dance				
I can explain the massacre at Wounded knee				
I can explain what Manifest Destiny is				
I can explain the end of the Native Americans way of life				

Spanish/ French

Key Ideas	S	O	R	T
I know my non-negotiable verbs for the past, present and future tenses				
I understand the meaning of all of the question words				
I understand the format of the writing exam and can write the success criteria from memory				
I understand how to be successful in a GCSE style role-play				
I regularly practise the high-frequency role-play vocabulary				
I understand how to be successful in a GCSE style photo-based speaking task				
I can say my general conversation introduction from memory				

Year 11 Learning Cycle 2 Personal Learning Check lists

Computin

Key Ideas	S	O	R	T
I can explain the purpose of Defensive design				
I can explain and identify Syntax and Logic errors in code				
I can explain what maintainability is and how it can be implemented.				
I know the different types of test data, how to design a test and how to record output in a test table.				
I can recognise the Boolean logic symbols AND, OR and NOT				
I can create logic tables for AND, OR and NOT				
I can combine Boolean logic symbols and produce the resulting logic table				
I can explain the reasons why an Intergrated Development Environment (IDE) is used .				
I can explain the difference between high -level and low lever coding languages				
I can discuss the Cultural, Legal, Environmental and Ethical issues in technology development				
I can explain the roles of an operating system.				
I can identify utility software and their use.				

Art

Key Ideas	R	A	G
Explain how to select, present and evaluate resource materials.			
Explain how to experiment with materials to realise intentions.			
Record and refine ideas.			
Explain how to develop ideas through contextualisation.			
Present a personal and meaningful response realising intention.			
Still Life project			
Conflict project			
Assemblage project			

Engineerin

Key Ideas	R	A	G
I can used drawings to show views and dimensions of components.			
I can use planning techniques to organise production of components.			
I can describe a range of hand tools used to produce components.			
I can describe a range of machine tools that form and shape materials.			
I can describe material categories and material uses.			
I can identify a range of ferrous and non Ferrous metals.			
I can describe the main properties of materials			

Year 11 Knowledge Organiser - J.B. Priestley's 'An Inspector Calls'

1. Context

1a. IMPORTANCE OF ERA The play was first performed at the end of World War II, which was a time of remarkable social and political change. Clement Attlee was elected as Prime Minister in 1945 by a significant majority. The Labour campaign was based on the slogan 'Let Us Face the Future'. By contrast, the play is set in 1912, which was a time of rigid social divisions. Women were still unable to vote and the tensions that eventually lead to the Russian Revolution were becoming increasingly visible.

1d. The Suffragette Movement

In 1865, upper and middle-class women began pushing for universal suffrage: the right for all adult women to vote and stand in political elections. However, this movement did not accelerate until 1903, when Emmeline Pankhurst founded the Women's Social and Political Union, later known as the Suffragettes. In 1912, when *An Inspector Calls* is set, the Suffragettes started more aggressive tactics, such as chaining themselves to buildings, setting fire to post boxes and smashing windows.

In the play, Eva Smith represents the struggles of the suffrage movement. Her encounter with Mr Birling mirrors the failed attempts of the Suffragettes to convince MPs to vote for universal suffrage prior to WW1. Therefore, Priestley uses Mr Birling as a reminder of the backwards thinking of men in the Edwardian era.

1b. Socialism and Capitalism

we know about the divide between the rich and poor, but the two political movements giving this divide momentum were socialism and capitalism. Socialism is the idea that all wealth should be distributed equally amongst the population, however, capitalism relies on industry and business to create wealth, and this wealth of course goes to the bourgeoisie.

You might be able to guess that the upper class and aristocracy were not pleased with the idea of sharing their wealth with the lower classes. This is seen through the character Arthur Birling, who is a blatant capitalist in the play. He alludes to Bernard Shaws and HG Wells (who were famous socialists), and claims "they can't do the talking". He also refers to them as "cranks", which was an offensive term.

Despite his strong and confident political views, Mr Birling proves that he is not a reliable character when he exclaims that "Germans don't want war" and refers to the "unsinkable Titanic". Priestley clearly uses this character to critique the obvious arrogance of the upper class, as the audience will unlikely believe him when he says that socialism has no value.

1e. SOCIETAL NORMS *An Inspector Calls* was written in 1945, however, it is set in 1912 and reflects the Edwardian era. King Edward ruled from 1901 to 1910, but the Edwardian era itself spans from the mid-1890s to 1914, the year when WW1 began. During these times, political movements were common: the main being the struggles of proletariats (the working class), highlighted against the growing success of the bourgeoisie (industry and business owners). Put simply, there was a big divide between the rich and the poor, which caused society to be conducted by a number of unsaid rules in order to keep the status quo. The rich perceived poor people to have no manners or sophistication, and it was strongly believed that no poor person could ever become wealthy. Not only this, but the rich treated the poor extremely inhumanely. They did not want to see or hear from the poor as they believed they were only there to serve a purpose. The rich were entitled to employ the poor and could sack and punish them as they pleased without consequence. The societal norm can therefore be put plainly: the rich were simply "better" than the poor. This led to the clear exploitation of the working class, allowing the rich to get richer and the poor to get poorer. Priestley critiques this flawed system throughout the play and suggests it is merely hypercritical and ineffective.

1c. THE TITANIC The Titanic was one of three 'Olympic Class' ships belonging to the White Star Line. These ships were significantly advanced for their time with progressive engineering, size, and speed. The ship was completed in only three years and was ready to sail from Southampton to New York with a variety of people seeking a better life in America. It's trip ended 4th April 1912 and tragically took over 1500 lives with it. The Titanic represented the luxury of the Edwardian era and foreshadowed the tragedy of World War One. The Titanic was viewed as indestructible and was seen as a symbol of strength, wealth and prosperity. It saw the loss of both rich and poor however the rich were more likely to survive due to the location of the life-rafts.

1f. World Wars

The play itself is a historical drama, set in the run-up to WW1. Dramatic irony is used by Priestley throughout the play - a situation in which the audience knows something that the characters do not.

The characters constantly refer to the mere possibility of a World War, and the calamities that would be huge landmarks in history to a post-war audience.

Not only this, the small-scale but devastating violence in the play alludes to the slaughter of many thousands that would come only a few years later in WW2.

2. PLOT & KEY QUOTATIONS

2a. 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. Gerland 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'**.

2b. 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'**.

2c. 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'**.

3. Vocabulary

3a = ostentatious (adj)

Characterized by pretentious or showy display

3b = condescending (adj)

Having or demonstrating an attitude of patronizing superiority

3c = Patriarchy (noun)

A system of society in which men hold the power and women are largely excluded from it.

3d = Privileged (adj)

Granted a special right, advantage, or immunity available only to a particular person or group

3e = Culpable (adj)

Deserving of blame

3f = Avarice (noun)

Extreme greed

3g = Disparage (verb)

To speak down to another in an insulting and rude manner

3h = Infantile (adj)

Acting like or likened to a young child

3i = Objectify (verb) = To

degrade something or someone to the status of a mere object

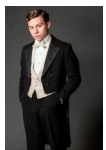

3j = didactic (adjective)

Intended to teach, or to improve morals by teaching

3k = Remorseful (adjective)

Full of regret for something they have done; sorry for past actions

4. Characters

<p>4a. Inspector Goole</p> <ul style="list-style-type: none"> ✓ Priestley's mouthpiece ✓ Impressive 	<ul style="list-style-type: none"> ✓ Commanding ✓ Social justice ✓ Omnipotent 	<p>"Massiveness, solidity and purposefulness." "But after all it's better to ask for the earth than to take it." "It's my duty to ask questions." "A nice promising life there, I thought, and a nasty mess somebody's made of it." "You see, we have to share something. If there's nothing else, we'll have to share our guilt." "One Eva Smith has gone - but there are millions and millions and millions of Eva Smiths and John Smiths still left with us." "Fire and blood and anguish"</p>	
<p>4b. Mr Arthur Birling</p> <ul style="list-style-type: none"> ✓ Capitalist ✓ Arrogant 	<ul style="list-style-type: none"> ✓ Verbose ✓ Stubborn ✓ Industrialist 	<p>"Heavy looking, rather portentous man" "A hard-headed practical man of business" "Just a knighthood, of course." "A man has to mind his own business and look after himself...." "Look - there's nothing mysterious - or scandalous - about this business..."</p>	
<p>4c. Mrs Sybil Birling</p> <ul style="list-style-type: none"> ✓ Judgmental ✓ Old money 	<ul style="list-style-type: none"> ✓ Traditional ✓ Insincere ✓ Controlling 	<p>"Rather cold woman... her husband's social superior." "Please don't contradict me like that" "It's disgusting to me." "Unlike the other three, I did nothing I'm ashamed of or that won't bear investigation." "He didn't make me confess - as you call it."</p>	
<p>4d. Sheila Birling</p> <ul style="list-style-type: none"> ✓ Intelligent ✓ Feminine 	<ul style="list-style-type: none"> ✓ Emotional ✓ Transformative ✓ Empowered 	<p>"But these girls aren't cheap labour - they're people" "I had her turned out of a job" "At least I'm trying to tell the truth. I expect you've done things you're ashamed of." "Why - you fool - he knows!" "The point is, you don't seem to have learnt anything."</p>	
<p>4e. Eric Birling</p> <ul style="list-style-type: none"> ✓ Irresponsible ✓ Spoilt 	<ul style="list-style-type: none"> ✓ Reckless ✓ Immature ✓ Transformative 	<p>"Not quite at ease half shy, half assertive." "I wasn't in love with her or anything -but I liked her -she was pretty and a good sport" "In a way, she treated me - as if I were a kid" "You're not the kind of father a chap could go to when he's in trouble." "You're beginning to pretend that nothing's really happed at all. And I can't see it like that."</p>	
<p>4f. Gerald Croft</p> <ul style="list-style-type: none"> ✓ Aristocratic ✓ Secretive 	<ul style="list-style-type: none"> ✓ Traditional ✓ Privileged ✓ Evasive 	<p>"Easy, well-bred young man-about-town." "You seem to be a nice well-behaved family" "You're just the kind of son-in-law I always wanted." "The hero... the wonderful Fairy prince." "I'm rather more upset - by this business than I probably appear to be -"</p>	
<p>4g. Eva Smith / Daisy Renton</p> <ul style="list-style-type: none"> ✓ Working class ✓ Determined 	<ul style="list-style-type: none"> ✓ Vulnerable ✓ Emblematic ✓ Allegorical 	<p>"A lively good-looking girl - country bred... and a good worker too." "She had a lot to say - far too much - so she had to go." "She was very pretty and looked as if she could take care of herself." "Now she had to try something else." She went away "to be alone, to be quiet, to remember all that had happened."</p>	

5. Themes

Wealth, power and influence	<p>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 Organization 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.</p>
Blame and Responsibility	<p>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 universalizes the shared responsibility that the Birlings feel for the girl's death, into a plea for something like 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 <i>already</i> responsible for each other so long as we are responsible for ourselves and our own actions.</p>
Class Politics	<p>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 factory, meanwhile, represent the Labor side of the conflict in trying to improve the rights and wages of laborers and the lower classes.</p> <p>Birling loosely articulates his understanding of the agitations in his speech to Eric and Gerald: "a man has to make his own way—has to look after himself...and so long as he does that he won't come to much harm... But the way some of these cranks talk and write now, you'd think everybody has to look after everybody else, as if we were all mixed up together like bees in a hive—a man has to mind his own business and look after himself." The Inspector speaks the voice of Socialism, of the Labor side of the conflict; he seeks to make the Birlings realize 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.</p>
Age	<p>Age is an important theme in <i>An Inspector Calls</i>. 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.</p>
Gender	<p><i>An Inspector Calls</i> 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.</p> <p>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.</p>

6. Authorial Intent

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

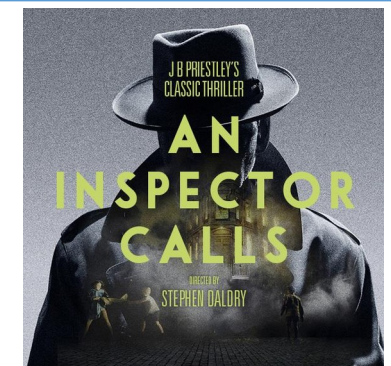
6a - To encourage... his audience to consider its own attitude towards the working and middle classes, entrepreneurs and gender issues

6b - To expose... the hypocrisy and double standards of certain strands of Edwardian society.

6c - To refute... Capitalist ideologies and highlight the exploitative nature of Capitalist societies.

6d - To warn... of the terrifying consequences of forsaking social responsibility and neglecting the needs of those who are less fortunate

6e - 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.



Year 11 Knowledge Organiser – Power and Conflict Poetry

Poem	Content, Meaning and Purpose	Context	Language	Form and Structure	Key quotations
<p>1. Ozymandias - Percy Bysshe Shelley</p>	<ul style="list-style-type: none"> 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 Ozymandias, ‘king of kings.’ The poem is ironic and one big metaphor: Human power is only temporary – the statue now lies crumbled in the sand, and the most powerful human creations cannot resist the power of nature. 	<ul style="list-style-type: none"> 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. He had been inspired by the French revolution – when the French monarchy was overthrown. 	<ul style="list-style-type: none"> ‘sneer of cold command’: Verb and 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 other ‘mighty’ kings to admire the size of his statue and ‘despair’. To despair because power is temporary. ‘The lone and level sands stretch far away.’: the desert is vast, lonely, and lasts far longer than a statue 	<ul style="list-style-type: none"> A sonnet (14 lines) but with an unconventional structure... the structure is normal until a turning point (a volta) at Line 9 (..these words appear). This reflects how human structures can be destroyed or decay. The iambic pentameter rhyme scheme is also disrupted or decayed. First eight lines (the octave) of the sonnet: the statue is described in parts to show its destruction. Final two lines: the huge & immortal desert is described to emphasise insignificance of human power. 	<ul style="list-style-type: none"> ‘I met a traveller from an antique land.’ ‘Two vast and trunkless legs of stone’. ‘Sneer of cold command.’ ‘Look on my works, ye Mighty, and despair!’ ‘Round the decay of that colossal wreck, boundless and bare.’ ‘Lone and level sands stretch far away.’
<p>2. London - William Blake</p>	<p>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. The poem uses rhetoric (persuasive techniques) to convince the reader that the people in power (landowners, Church, Government) are to blame for this inequality.</p>	<p>Poem was published in 1794, at a time of great poverty in many parts of London. Blake was an English poet and artist. Much of his work was influenced by his radical political views: he 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. Questioned the teachings of the Church & decisions of Govt.</p>	<p>Sensory language creates an immersive effect: visual imagery (‘Marks of weakness, marks of woe’) and aural imagery ‘‘cry of every man’</p> <p>‘mind-forged manacles’: they are trapped in poverty.</p> <p>Rhetorical devices to persuade: repetition (‘In every..’); emotive language (‘infant’s cry of fear’). Criticises the powerful: ‘each chartered street’ – everything is owned by the rich; ‘Every black’ning church appalls’ - the church is corrupt; ‘the hapless soldier’s sigh /Runs in blood down palace walls’-soldiers suffer/die due to decisions of powerful.</p>	<p>A dramatic monologue, there is a first- person narrator (‘I) who speaks passionately about what he sees.</p> <p>Simple ABAB rhyme scheme: reflects the unrelenting misery of the city, and perhaps the rhythm of his feet as he trudges around the city.</p> <p>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.</p>	<p>‘I wander through each chartered street.’</p> <p>‘Marks of weakness, marks of woe.’</p> <p>‘Every cry of every man’.</p> <p>‘Every black’ning church appalls’.</p> <p>‘Hapless soldier’s sigh runs in blood down palace walls.’</p> <p>‘Youthful harlot’s curse’.</p>

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Poem	Content, Meaning and Purpose	Context	Language	Form and Structure	Key quotations
<p>3. Extract from 'The Prelude' – William Wordsworth</p>	<ul style="list-style-type: none"> The story of a boy's love of nature and a night-time adventure in a rowing boat that instils a deeper and fearful respect for power of nature. At first, the boy is calm and confident, but the sight of a huge mountain that comes into view scares the boy and he flees. He is now in awe of the mountain & fearful of the power of nature (described as 'huge and mighty forms') We should respect nature & not take it for granted. 	<ul style="list-style-type: none"> Published shortly after his death, The Prelude was a very long poem (14 books) that told the story of Wordsworth's life. This extract is the first part of a book entitled 'Introduction – Childhood and School-Time'. 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. 	<ul style="list-style-type: none"> 'One summer evening (led by her)': 'her' might be nature personified – this shows his love for nature. 'an act of stealth / And troubled pleasure': confident, but oxymoron suggests he knows it's wrong; forebodes troubling events that follow. 'nothing but the stars and grey sky': emptiness of sky. 'the horizon's bound, a huge peak, black and huge': the image of the mountain is more shocking (contrast). 'Upreared its head' and 'measured motion like a living thing': mountain is personified as a powerful beast, but calm – contrasts with his own inferior panic. 'There hung a darkness': lasting effects of mountain. 	<ul style="list-style-type: none"> 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 Contrasts in tone: 'lustily I dipped my oars into the silent lake' versus 'I struck and struck again' and 'with trembling oars I turned'. 	<ul style="list-style-type: none"> 'Straight I unloosed her chain'. 'It was an act of stealth and troubled pleasure'. 'Leaving behind her still, on either side, small circles glittering idly in the moon'. 'I fixed my view upon the summit of a craggy ridge'. 'Lustily I dipped my oars into the silent lake'. 'My boat went heaving through the water like a swan'. 'With trembling oars I turned'.
<p>4. My Last Duchess – Robert Browning</p>	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Browning was a British poet, and lived in Italy. The poem was published in 1842. 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. 	<ul style="list-style-type: none"> 'Looking as if she was alive': sets a sinister tone. 'Will't please you sit and look at her?' rhetorical question to his visitor shows obsession with power. 'she liked whate'er / She looked on, and her looks went everywhere.': hints that his wife was a flirt. '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. 'I gave commands; Then all smiles stopped together': euphemism for his wife's murder. 	<ul style="list-style-type: none"> 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. He is a little unstable. 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' Dramatic Irony: the reader can read between the lines and see that the Duke's comments have a much more sinister undertone 	<ul style="list-style-type: none"> 'That's my last Duchess painted on the wall, / Looking as if she were alive'. 'I call that piece a wonder, now'. Too easily impressed; she liked whate'er she looked on'. 'Who'd stoop to blame this sort of trifling?' 'and I choose never to stoop.' 'Notice Neptune, though, / Taming a sea-horse'.

Year 11 Knowledge Organiser – Power and Conflict Poetry

Poem	Content, Meaning and Purpose	Context	Language	Form and Structure	Key quotations
<p>5. The Charge of the Light Brigade – Alfred Lord Tennyson</p>	<ul style="list-style-type: none"> Published six weeks after a disastrous battle against the Russians in the (unpopular) Crimean War 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. It is a celebration of the men’s courage and devotion to their country, symbols of the might of the British Empire. 	<ul style="list-style-type: none"> As Poet Laureate, he had a responsibility to inspire the nation and portray the war in a positive light: propaganda. Although Tennyson glorifies the soldiers who took part, he also draws attention to the fact that a commander had made a mistake: “Someone had blunder’d”. This was a controversial point to make in Victorian times when blind devotion to power was expected. 	<ul style="list-style-type: none"> “Into the valley of Death”: this Biblical imagery 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”: 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. 	<ul style="list-style-type: none"> This is a ballad, a form of poetry to remember historical events – we should remember their courage. 6 verses, each representing 100 men who took part. First stanza tightly structured, mirroring the cavalry formation. Structure becomes awkward to reflect the chaos of battle and the fewer men returning alive. 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. 	<p>‘Half a league, half a league, half a league onward.’ ‘All in the valley of Death / Rode the six hundred’. ‘Charge for the guns!’ ‘Cannon to the right of them’. ‘Storm’d at with shot and shell’. ‘Boldly they rode and well, / Into the jaws of Death’. ‘Flash’d all their sabres bare’. ‘Plunged in the battery- smoke.’ ‘Whole horse and hero fell’. ‘Honour the charge they made!’ ‘Honour the Light Brigade, / Noble six hundred.’</p>
<p>6. Exposure – Wilfred Owen</p>	<ul style="list-style-type: none"> Speaker describes war as a battle against the weather and conditions. Imagery of cold and warm reflect the delusional mind of a man dying from hypothermia. Owen wanted to draw attention to the suffering, monotony and futility of war. 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> “Our brains ache” physical (cold) suffering and mental (PTSD or shell shock) suffering. - Semantic field of weather: weather is the enemy. “the merciless iced east winds that knife us...” – personification (cruel and murderous wind); sibilance (cutting/slicing sound of wind); ellipsis (never-ending). Repetition of pronouns ‘we’ and ‘our’ – conveys togetherness and collective suffering of soldiers. ‘mad gusts tugging on the wire’ – personification 	<ul style="list-style-type: none"> Contrast of Cold>Warm>Cold imagery conveys Suffering>Delusions>Death of the hypothermic soldier. Repetition of “but nothing happens” creates circular structure implying never ending suffering Rhyme scheme ABBA and hexameter gives the poem structure and emphasises the monotony. Pararhymes (half rhymes) (“nervous / knife us”) only barely hold the poem together, like the men. 	<p>‘ Our brains ache, in the merciless iced east winds that knife us.’ ‘Low, dropping flares confuse our memory of the salient.’ ‘Worried by silence’. ‘We hear the mad gusts tugging on the wire.’ ‘The flickering gunnery rumbles.’ ‘The poignant misery of dawn begins to grow.’ ‘Sudden successive flights of bullets streak the silence.’</p>

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Poem	Content, Meaning and Purpose	Context	Language	Form and Structure	Key quotations
<p>7. Storm on the Island - Seamus Heaney</p>	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Seamus Heaney was Northern Irish, he died in 2013. This 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 might be a metaphor for the political storm that was building in the country at the time. 	<ul style="list-style-type: none"> 'Nor are there trees which might prove company': the island is a lonely, barren place. Violent verbs are used to describe the storm: 'pummels', 'exploding', 'spits'. Semantic field of war: 'Exploding comfortably' (also an 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. -'spits like a tame cat turned savage': simile compares the nature to an animal that has turned on its owner. 	<ul style="list-style-type: none"> Written in blank verse and with lots of enjambment: this creates a conversational and anecdotal tone. We' (first person plural) creates a sense of community, and 'You' (direct address) makes the reader feel immersed in the experience. 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.' 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. 	<p>'We are prepared: we build our houses squat'. 'Sink walls in rock and roof'. 'there are no stacks or stooks that can be lost'. 'Blast: you know what I mean'. 'leaves and branches / Can raise a tragic chorus in a gale.' 'It pummels your house too.' 'The flung spray hits / The very windows.' 'Spits like a tame cat / Turned savage.' 'We are bombarded by the empty air.'</p>
<p>8. Bayonet Charge - Ted Hughes</p>	<ul style="list-style-type: none"> Describes the terrifying experience of 'going over the top': fixing bayonets (long knives) to the end of rifles and 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 from a living thinking person into a dangerous weapon of war. Hughes dramatises the struggle between a man's thoughts and actions. 	<ul style="list-style-type: none"> Published in 1957, but most- likely set in World War 1. Hughes' father had survived the battle of Gallipoli in World War 1, and so he may have wished to draw 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, 	<ul style="list-style-type: none"> The patriotic tear that brimmed in his eye Sweating like molten iron": his sense of duty (tear) has now turned into hot sweat of fear/pain. "cold clockwork of the stars and nations": the soldiers are part of a cold and uncaring machine of war. "his foot hung like statuary in midstride.": he is frozen with fear/bewilderment. The caesura (full stop) jolts him back to reality. "a yellow hare that rolled like a flame And crawled in a threshing circle": impact of war on nature – the hare is distressed like the 	<ul style="list-style-type: none"> The poem starts 'in medias res': in the middle of the action, to convey shock and pace. Enjambment maintains the momentum of the charge. Time stands still in the second stanza to convey the soldier's bewilderment and reflective thoughts. Contrasts the visual and aural imagery of battle with the internal thoughts of the soldier = adds to the confusion. 	<p>'Suddenly he awoke and was running – raw.' 'Raw-seamed hot khaki.' 'Bullets smacking the belly out of the air.' 'The patriotic tear that had brimmed in his eye.' 'Sweating like molten iron from the centre of his chest.' 'Threw up a yellow hare that rolled like a flame.' 'He plunged past with his bayonet toward the green</p>

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Poem	Content, Meaning and Purpose	Context	Language	Form and Structure	Key Quotations
<p>9. Remains - Simon Armitage</p>	<ul style="list-style-type: none"> □ Written to coincide with a TV documentary about those returning from war with PTSD. □ Based on Guardsman Tromans, who fought in Iraq in 2003. □ Speaker describes shooting a looter dead in Iraq and how it has affected him. □ To show the reader that mental suffering can persist long after physical conflict is over. 	<ul style="list-style-type: none"> □ 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. 	<ul style="list-style-type: none"> □ “Remains” -images/suffering remain. □ “Legs it up the road” - colloquial language = authentic voice □ “Then he’s carted off in the back of a lorry” – reduction of humanity to waste or cattle. □ “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” – alludes to Macbeth: Macbeth the warrior with PTSD and Lady Macbeth’s bloody hands and guilt. 	<ul style="list-style-type: none"> □ 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. □ Enjambment 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 	<ul style="list-style-type: none"> □ ‘We get sent out to tackle looters raiding a bank’. □ ‘Probably armed, possibly not’. □ ‘Three of a kind all letting fly’. □ ‘I see broad daylight on the other side’. □ ‘So we’ve hit this looter a dozen times’. □ ‘the image of agony’. □ ‘One of my mates goes by and tosses his guts back into his body’. □ ‘I walk right over it week after week’.
<p>10. Poppies - Jane</p>	<ul style="list-style-type: none"> □ A modern poem that offers an alternative interpretation of bravery in conflict: it does not focus on a soldier in battle but on the mother who is left behind and must cope with his death. □ The narration covers her visit to a war memorial, interspersed with images of the soldier’s childhood and his departure for war. 	<ul style="list-style-type: none"> □ 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 a critical tone; about how soldiers can become intoxicated by the glamour or the military: “a blockade of yellow bias” 	<ul style="list-style-type: none"> □ Contrasting semantic fields of home/childhood (“cat hairs”, “play at being Eskimos”, “bedroom”) with war/injury (“blockade”, bandaged”, “reinforcements”) □ Aural (sound) imagery: “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. □ “I was brave, as I walked with you, to the front door”: different perspective 	<ul style="list-style-type: none"> □ This is an Elegy, a poem of mourning. □ Strong sense of form despite the free verse, stream of consciousness addressing her son directly – poignant □ No rhyme scheme = melancholic □ Enjambment gives it an anecdotal tone. □ Nearly half the lines have caesura – she is 	<ul style="list-style-type: none"> □ ‘Crimped petals, spasms of paper red, disrupting a blockade of yellow bias binding around your blazer’. □ ‘Sellotape bandaged around my hand.’ □ ‘I wanted to graze my nose across the tip of your nose.’ □ ‘I resisted the impulse to run my fingers through the gelled blackthorns of your hair.’ □ ‘A split second and you were away, intoxicated’.

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Poem	Content, Meaning and Purpose	Context	Language	Form and Structure	Key Quotations
<p>11. War Photographer – Carol Ann Duffy</p>	<p>Tells the story of a war photographer developing photos at home in England: as a photo develops he begins to remember the horrors of war - painting a contrast to the safety of his dark room.</p> <ul style="list-style-type: none"> □ He appears to be returning to a warzone at the end of the poem. □ 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. 	<p>Like Tennyson and Ted Hughes, Duffy was the Poet Laureate.</p> <ul style="list-style-type: none"> □ Duffy was inspired to write this poem by her friendship with a war photographer. She was intrigued by the challenge faced by these people whose job requires them to record terrible, horrific events without being able to directly help their subjects. □ The location is ambiguous and therefore universal: (“Belfast. Beirut. Phnom Penh.”) 	<p>All flesh is grass”: Biblical reference that means all human life is temporary – we all die eventually.</p> <ul style="list-style-type: none"> □ “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. □ “blood stained into a foreign dust”: lasting impact of war – links to Remains and ‘blood shadow’. □ “he earns a living and they do not care”: ‘they’ is ambiguous – it could refer to readers or the wider world 	<p>Enjambment – reinforces the sense that the world is out of order and confused.</p> <ul style="list-style-type: none"> □ 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. □ Third stanza: A specific image – and a memory – appears before him 	<ul style="list-style-type: none"> □ ‘In his darkroom he is finally alone’. □ ‘The only light is red and softly glows’. □ ‘All flesh is grass’. □ ‘Solutions slop in trays beneath his hands’. □ ‘A stranger’s features faintly start to twist before his eyes, a half-formed ghost’. □ ‘The blood stained into foreign dust’. □ ‘The reader’s eye balls prick with tears’.
<p>12. Tissue – Imtiaz Dharmjee</p>	<ul style="list-style-type: none"> □ 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. 	<p>Imtiaz Dharker was born in Pakistan and grew up in Glasgow.</p> <ul style="list-style-type: none"> □ ‘Tissue’ is taken from a 2006 collection of poems entitled ‘The Terrorist at My Table’: the collection questions how well we know people around us. □ This particular poem also questions how well we understand ourselves and the fragility of humanity. 	<ul style="list-style-type: none"> □ 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 monoliths (stone statues). □ ‘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. 	<ul style="list-style-type: none"> □ 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. □ All stanzas have four lines, except the final stanza which 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 	<ul style="list-style-type: none"> □ “If buildings were paper, I might feel their drift.” □ “Paper thinned by age or touching.” □ “The kind you feel in well-used books.” □ “Paid by credit card might fly our lives like paper kites.” □ “Living tissue, raise a structure never meant to last.” □ “Paper smoothed and stroked and thinned to be transparent.” □ “Turned in to your skin.” □ “Shapes that pride can make.” □ “Never wish to build again with brick.”

Year 11 Knowledge Organiser – Power and Conflict Poetry

Poem	Content, Meaning and Purpose	Context	Language	Form and Structure	Key Quotations
<p>13. The Emigre - Carol Rumens</p>	<ul style="list-style-type: none"> □ Emigre' – 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. The city is now “sick with tyrants”. □ Despite the cities problems, her positive memories of the place cannot be extinguished. 	<ul style="list-style-type: none"> □ Emigre was published in 1993. The home country of the speaker is not revealed – this ambiguity gives the poem a timeless relevance. □ Increasingly relevant to many people in current world climate 	<ul style="list-style-type: none"> □ “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. □ 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 – despite the fact that she had to flee – she is strong. □ Semantic field of conflict: “Tyrant, tanks, frontiers” 	<ul style="list-style-type: none"> □ First person. □ The last line of each stanza is the same (epistrophe): “sunlight”: reinforces the overriding positivity of the city and of the poem. □ 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. 	<ul style="list-style-type: none"> □ “There once was a country... I left it as a child.” □ “The worst news I receive of it cannot break.” □ “It may be at war, it may be sick with tyrants.” □ “The graceful slopes glow even clearer as time rolls its tanks.” □ “That child`s vocabulary I carried here like a hollow doll.” □ “Soon I shall have every coloured molecule of it.” □ “I have no passport, there`s no way back at all.” □ “My city takes me dancing through the city.”
<p>14. Checking Out Me History - John Agard</p>	<ul style="list-style-type: none"> □ Represents 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. 	<ul style="list-style-type: none"> □ John Agard was born in the Caribbean in 1949 and moved to the UK in the 1970s. □ His poetry challenge racism and prejudice. □ This poem may, to some extent, have achieved its purpose: in 2016, a statue was erected in London in honour of Mary Seacole, one of the subjects of the poem. 	<ul style="list-style-type: none"> □ Imagery of fire and light used in all three stanzas regarding black historic figures: “Toussaint de beacon”, “Fire-woman”, “yellow sunrise”. □ Uses non-standard phonetic 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. 	<ul style="list-style-type: none"> □ Dramatic monologue, with a dual structure. □ Stanzas concerning Eurocentric history (normal font) are interspersed with stanzas on black history (in italics to represent separateness and rebellion). □ Black history sections arranged as serious lessons to be learned; traditional history as nursery rhymes, mixed with fairytales (mocking of traditional history). □ The lack of punctuation, the stanzas in free verse, the irregular rhyme scheme and the use of Creole could represent the narrator’s rejection of the rules. □ Repetition of “Dem tell me”: frustration. 	<ul style="list-style-type: none"> □ “Dem tell me bout 1066 and all dat.” □ “Bandage up me eye with me own history.” □ “But Toussaint L`Ouverture no dem never tell me bout dat.” □ “Dem never tell me bout Shaka de great Zulu.” □ “Dem never tell me bout Mary Seacole.” □ “From Jamaica she travel far to the Crimean War.” □ “But now I checking out me own history.” □ I carving out me identity.”

Year 11 Knowledge Organiser – Power and Conflict Poetry

Poem	Content, Meaning and Purpose	Context	Language	Form and Structure	Key Quotations
15. Kamikaze – Beatri ce Garland	<ul style="list-style-type: none"> □ In World War 2, Japanese Kamikaze pilots would fly manned missiles into targets such as ships. □ 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 	<ul style="list-style-type: none"> □ Cowardice or surrender was a great shame in wartime Japan. □ To surrender meant shame for you and your family, and rejection by society: “he must have wondered which had been the better way to die”. 	<ul style="list-style-type: none"> □ The Japanese word ‘kamikaze’ means ‘divine wind’ or ‘heavenly wind’, and has its origin in a heaven-sent storm that scattered an invading fleet in 1250. □ “dark shoals of fish flashing silver”: image links to a Samurai sword – conveys the conflict between his love for nature/life and his sense of duty. Also has sibilance. □ “they treated him as though he no longer existed”: cruel irony – he chose to live but now must live as though he is dead. □ “was no longer the father we loved”: the pilot was forever affected by his decision. 	<ul style="list-style-type: none"> □ Narrative and speaker is third person, representing the distance between her and her father, and his rejection by society. □ The first five stanzas are ordered (whilst he is flying on his set mission). □ Only full stop is at the end of Stanza Five: he has made his decision to turn back. □ The final two are in italics and have longer line to represent the fallout of his decision: his life has shifted and will no longer be the same. □ Direct speech (“My mother never spoke again”) gives the poem a personal tone. 	<ul style="list-style-type: none"> □ “Her father embarked at sunrise.” □ “In the cockpit, a shaven head full of powerful incantations.” □ “For a one-way journey in to history.” □ “Beneath them, arcing in swathes like a huge flag.” □ “Remembered how he and his brothers waiting on the shore.” □ “Yes, grandfather`s boat – safe.” □ “Gradually we too learned to be silent, to live as though he had never returned.”
16. Poetic techniques	Stanza – a group of lines in a poem.	Caesura – using punctuation to create pauses or stops.	Volta – a turning point in a poem.	Tone – the mood or feeling created in a poem.	Colloquial Language – informal language, usually creates a conversational tone or authentic voice.
	Repetition – repeated words or phrases			Metaphor – comparing one thing to another using ‘is’ although it is not literally applicable.	
	Enjambment – a sentence or phrase that runs onto the next line.	Contrast – opposite concepts/feelings in a poem. Juxtaposition – contrasting things placed side by side.		Persona – the narrator, or person in the poem. Free verse – poetry that doesn’t rhyme. Blank verse – poem in iambic pentameter, but with no rhyme. Sonnet – poem of 14 lines with clear rhyme scheme.	
Irony – language that says one thing but implies the opposite e.g. sarcasm.	Oxymoron – a phrase that contradicts itself.	Rhyming couplet – a pair of rhyming lines next to each other.	Pathetic Fallacy – giving emotion to weather to create a mood within a text.	Onomatopoeia – language that sounds like its meaning. Alliteration – words that are close together start with the same letter or sound.	
					Sibilance – the repetition of s or sh sounds. Assonance – the repetition of similar vowel sounds Consonance – repetition of consonant sounds. Plosives – short burst of sound: t, k, p, d, g, or b sound.

Year 11 Knowledge Organiser: Unseen Poetry

1. How to Approach an Unseen Poem

M - Meaning
My

What is the poem **about**? Who or what does it **focus** on? What **idea(s)** are most important?

L - Language
Little

Which **words** are most important? What are their **meanings** and **connotations**? Has the writer used any **similes, metaphors or personification**? Are their **sounds** important?

T - Tone
Toe

What **tone** does the poet adopt?

I - Imagery
Is

What are the most important **images** in the poem? How do they add to the writer's idea(s)?

S - Structure
Small



What is interesting about **line length** or **stanza length**? How does the poem **begin and end**? Are there any significant **punctuation marks** (or lack of punctuation)? Why is the **rhythm** or **rhyme** important?

2. Writing Your Answer

Introduction summarising the poet's meanings and **three 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	evokes
presents	conjures
asserts	
indicates	establishes
depicts	
	compares
suggests	contrasts
implies	juxtaposes
alludes to	mirrors
connotes	reflects
	parallels
highlights	
emphasises	adumbrates
underlines	
reiterates	

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

4. Subject Vocabulary

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 the 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

Year 11 English Language Paper 1 Knowledge Organiser (80 marks & 50% of English Language GCSE)

Section A - READING 40 marks (50% of Language Paper 1 - 1 hour: 15 minutes reading and 45 minutes writing)

1. The Questions

Question 1: List four things... [4]	Question 2: Language [8]	Question 3: Structural terminology [8]	Question 4: Evaluation (use methods from Questions 1 and 2 + effect + evaluate statement) [20]
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2. Language Methods Terms		2. Structure Methods Terms		3. Verbs for Analysis				4. Connectives for Developing Ideas	
Noun	Identifies a person, thing, idea or state	Chronological	The order of sequenced events	achieves	affects	allows	alludes to	Firstly...secondly	Moreover
Verb	Describes an action, event, situation or change	Linear	Events are told chronologically	possibly	builds	concludes	confirms	Furthermore	Again
Adverb	Gives information about a verb	Non-Linear	Events are not told chronologically	conveys	denotes	develops	demonstrates	In addition	Besides
Diction	The writer's choice of words	Dual	Told by two perspectives	displays	causes	exaggerates	encourages	Above all	In fact
Imagery	When the writer provides mental "pictures"	Cyclical	Ends the same way it begins	enhances	establishes	exemplifies	explains	Finally	To conclude
Irony	Like sarcasm, where the opposite is implied	Opening	The way the extract begins	explores	exposes	forces	generates	Lastly	Simply
List of three	A trio of events or adjectives	Focusing	Our attention is aimed at something	highlights	hints	gives a sense	illustrates	In view of this	With this in mind
Metaphor	Something is described as something else	Building	When an idea/tension is increased	impacts	implies	identifies	indicates	That is to say	In other words
Pathos	Language used to appeal to the emotions	Developing	An earlier point is extended	initiates	introduces	involves	justifies	For example	By contrast
Personification	Giving human traits to something non-human	Narrative shift	A swift or change of focus	juxtaposes	maintains	manifests	offers	Alternatively	On the contrary
Semantic field	A set of words related in meaning	Zooming in	Detailed description of something	portrays	presents	produces	promotes	Despite	Although
Simile	Something is presented as like something else	Zooming out	Showing the reader the bigger picture	provokes	questions	represents	reveals	Therefore	It is evident that
Onomatopoeia	Sound words	Concluding	Ideas/events are drawn to a close	signifies	suggests	symbolises	typifies	However	Conversely
Pathetic fallacy	Weather reflects the mood	Flash-forward	Presents future events	upholds	validates	verifies	yields	This also	Meanwhile
Colloquialisms	Slang or informal language	Foreshadowing	Hints at what's to come	augments	opposes	creates	links to	On the other hand	Consequently
Adjectives	Words that describe the noun	Climax	The most intense point	serves	isolates	adds to	reinforces	Regardless of	What is more

Section B - Writing 40 marks (50% of Language Paper 1 - 45 minutes)

5. Vocabulary to Describe Positive Characters, Settings or Events							6. Vocabulary to Describe Negative Characters, Settings or Events						
Awe	Ethereal	Euphoric	Enlightened	Opulent	Emanates	Alluring	Melancholy	Cacophony	Ominous	Malicious	Morose	Vile	Dire
Serene	Thriving	Exuberant	Vivacious	Virtuous	Luminous	Captivating	Heinous	Loathsome	Grave	Savage	Withering	Flawed	Venomous

How to revise in Mathematics



1) Be Organised

•You will need a revision guide, your learning cycle knowledge organiser and your Maths equipment (Scientific calculator, protractor, pair of compasses)

You need to identify the areas you need to focus on by RAG the PLC in your knowledge organiser

2) Follow the SORT strategy

For each topic:

Watch a video www.corbettmaths.com

Summarise the information (Cornell notes, flashcards, mind map)

Recall - use look, cover, test, Blurt It or Leitner system to help memorise your summary

Test - complete pages in your revision guide or past exam questions on the topic www.corbettmaths.com

Regularly complete past exam papers www.onmaths.com

3) Use the support available

- Intervention sessions
- Lunch time support
- Class teachers

4) Complete your daily Complete Maths goal

Work through the courses allocated to you

- Learn - watch the videos
- Do - practice the example problem pairs
- Test - complete the quiz (80% pass)

5) Other really helpful websites

<https://www.revisely.co.uk/gcse/maths/edexcel>

<https://www.onmaths.com/>

<https://www.mathsgenie.co.uk/gcse.html>

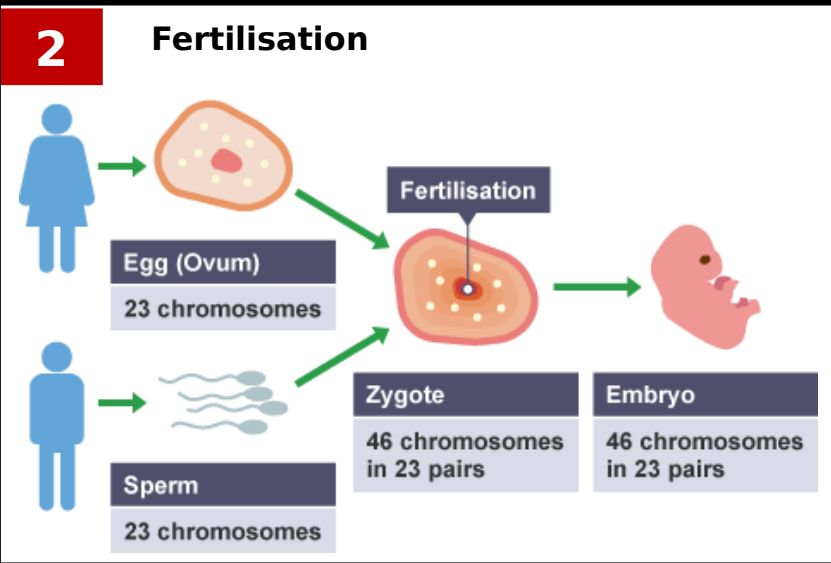
<https://mmerevise.co.uk/gcse-maths-revision/#revise>



At Poltair we **SORT** it!

Year 11 Science Knowledge Organiser Learning Cycle 2 - Inheritance, variation and evolution

1	Key words	Definition
Asexual reproduction	Type of reproduction involving only one parent	
Gametes	Sex cells (E.g. sperm and egg)	
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 is the basic unit of classification.	
Gene	Small section of DNA on a chromosome that codes for a particular characteristic	
Alleles	Different versions of the same genes	



3 Genetic inheritance

Monohybrid crosses

Genetic crosses of single gene combinations (monohybrid inheritance) can be shown and examined using Punnett squares. This shows the possible offspring combinations could be produced, and the **probability** of these combinations can be calculated.

Worked example 1

The height of pea plants is controlled by a single gene which has two alleles: tall and short.

The tall allele is dominant and is shown as T.

The small allele is recessive and is shown as t.

The female is TT - tall

The male is tt - short

	T	T
t	Tt	Tt
t	Tt	Tt

If you add the combinations into each box you see that all the possible offspring have the same allele combination - Tt.

Note: You should **always write the dominant allele first**.

This means that all the offspring produced will be tall.

- males have two different sex chromosomes, X Y
- females have two X chromosomes, XX

5 Inherited disorders

Cystic fibrosis

Cystic fibrosis is an inherited disorder of cell membranes that mainly affects the lungs and digestive system. They can become clogged with lots of thick, sticky mucus as too much is produced. Over many years, the lungs become increasingly damaged and may eventually stop working properly. A number of treatments are available to help reduce the problems caused by the condition, but unfortunately average life expectancy is reduced for people who have it.

It is caused by a faulty **recessive allele** on chromosome 7. To be born with cystic fibrosis, a child has to inherit two copies of this faulty gene - one from each of their parents. Their parents will not usually have the condition themselves, because they will only carry one faulty gene and one that works normally.

In the diagram below cystic fibrosis involves:

- the recessive allele (lower case), which can be shown as f
- the dominant allele (capital letter), which can be shown as F

The diagram shows a Punnett square for cystic fibrosis. Parent 1 (Ff) and Parent 2 (Ff) produce gametes F and f. The possible combinations of alleles in offspring are FF (Normal), Ff (Carrier), Ff (Carrier), and ff (Cystic Fibrosis).

Polydactyly

Polydactyly is an inherited condition in which a person has extra fingers or toes. It is caused by a **dominant** allele of a gene. This means it can be passed on by just one allele from one parent if they have the disorder.

Someone who is homozygous (PP) or heterozygous (Pp) for the dominant allele will develop polydactyly.

Genetic tests

Genetic testing involves analysis of a person's **DNA** to see if they carry alleles that cause genetic disorders. It can be done at any stage in a person's life.

6 Further reading

[Inheritance, variation and evolution - GCSE Combined Science Revision - AQA Trilogy - BBC Bitesize](#)

Year 11 Science Knowledge Organiser Learning Cycle 2 - Inheritance, variation and evolution

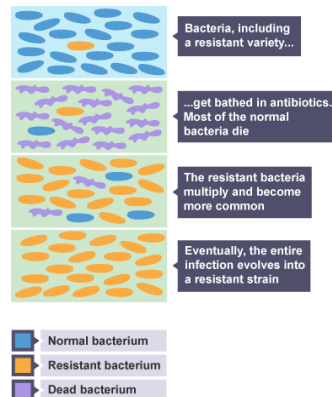
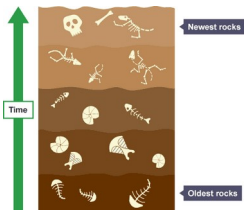
1	Definition
Key words	
Evolution	The change of inherited characteristics within a population over time through natural selection, which may result in the formation of a new species
Natural selection	The natural process whereby the best-adapted individuals survive longer, have more offspring. Referred to as survival of the fittest
Variation	Difference between individuals, distance from the norm.
Amber	Hardened tree resin

2 Evidence for evolution

Fossils

A **fossil** is the preserved remains of a dead **organism** from millions of years ago. Fossils are found in rocks and can be formed from:

- hard body parts, such as **bones and shells**, which do not decay easily or are replaced by minerals as they decay
- parts of organisms that have not decayed because one or more of the conditions needed for decay are absent. For example, **dead animals and plants** can be preserved in **amber**, peat bogs, tar pits, or in ice
- preserved traces of organisms, such as **footprints, burrows** and rootlet traces - these become covered by layers of **sediment**, which eventually become rock



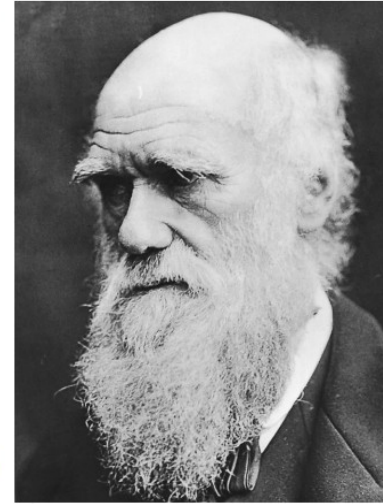
3 Charles Darwin

Darwin's theory of evolution

Charles Darwin was an English naturalist who studied variation in plants, animals and fossils during a five-year voyage around the world in the 19th century. Darwin visited four continents on the ship HMS Beagle.

Darwin observed many organisms including finches, tortoises and mocking birds, during his five week visit to the **Galapagos Islands**, near Ecuador in the Pacific Ocean. He continued to work and develop his ideas once he returned from his voyages.

Darwin's theory of evolution challenged the idea that God made all the animals and plants that live on Earth, which contradicted the commonly held Christian views of his era. He did not publish his scientific work and ideas until 28 years after his voyage.



Charles Darwin

Darwin proposed that:

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

This theory is called natural selection.

5 Problems with evolution

Darwin ideas were documented in the book *On the Origin of Species*, which was published in 1859. The naturalist's ideas created controversy in Victorian society.

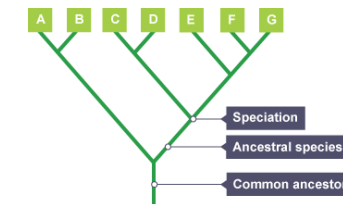
The theory of evolution through the process of natural selection was only gradually accepted because:

- the theory challenged the idea that God made all animals and plants that live on Earth (creationism)
- there was insufficient evidence when the theory was published to convince many scientists
- the mechanism of inheritance and variation was not known until 50 years after the theory was published

Some scientists were reluctant to change their minds about the ideas of creationism, even when new evidence was discovered that contradicted their ideas.

Darwin's book, *On the Origin of Species*, was a world best seller and is still in print today. With every new edition of his book, more evidence was discovered to support Darwin's ideas. This led to the development of his theory over time. In a later edition, he introduced the famous term 'Survival of the fittest'.

Evolutionary trees



6 Further reading

[Inheritance, variation and evolution - GCSE Combined Science Revision - AQA Trilogy - BBC Bitesize](#)

Year 11 Science Knowledge Organiser Learning Cycle 2 - Inheritance, variation and evolution (Triple science only)

1	Definition
Key words	
Speciation	The formation of new and distinct species in the course of evolution
Extinction	No remaining individuals of a species alive

2 Lamark's theory of evolution

Lamarck's theory suggested that the giraffe's original short-necked ancestor repeatedly stretched its neck to reach the higher branches to eat. Lamarck believed that the stretching elongated the giraffe's neck, which became a useful characteristic and was passed onto future generations. This resulted in the length of the giraffe's neck increasing over time.

It is now commonly accepted that Lamarck's ideas were wrong. For example, simple organisms are still detected in all varieties of life, plus it is now known that mutations can create variation such as neck length.

3 Speciation

Alfred Russel Wallace created pioneering work in speciation; however, additional evidence over time has led to our current understanding of the theory of **speciation**.

A **species** is a group of organisms able to interbreed and produce fertile offspring.

New species can arise as a result of the following things:

- genetic variation - each population has a wide range of **alleles** that can control their characteristics
- natural selection - the alleles which help an **organism** to survive are selected in each population
- speciation - the populations become extremely varied and successful interbreeding cannot happen anymore

New species can also arise as a result of **isolation**:

- two populations of a species can become geographically separated because of the environment
- isolation can prevent interbreeding and the combination of genes within a species
- different mutations can take place in the isolated groups and create different **phenotypes** within a particular location
- over time species may evolve to be different to each other, and they will not be able to interbreed

Animals that have not adapted well to their environment are less likely to survive and reproduce than those that are well adapted. The animals that have not adapted to their environment may become extinct. Extinction has a role in evolution as some species disappear. Others survive and continue to evolve.

Several factors can cause a species to become extinct. They include:

- new diseases
- new **predators**
- new, more successful competitors
- changes to the environment over geological time, such as climate change
- a single catastrophic event, such as a massive volcanic eruption or a collision between an asteroid and the Earth

Inheritance, variation and evolution - GCSE Biology (Single Science) Revision - AQA - BBC Bitesize

Year 11 Science Knowledge Organiser Learning Cycle 2 - Rates of reaction

1

Key words

Definition

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

Rate of reaction

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

Collision theory

For a chemical reaction to happen:

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

A collision that produces a reaction is called a **successful collision**. The **activation energy** is the minimum amount of **energy** needed for a collision to be successful. It is different for different reactions.

3

Calculating mean rate of reaction

$$\text{mean rate of reaction} = \frac{\text{quantity of reactant used}}{\text{time taken}}$$

$$\text{mean rate of reaction} = \frac{\text{quantity of product formed}}{\text{time taken}}$$

4

Measuring mass and measuring volume

Measuring mass

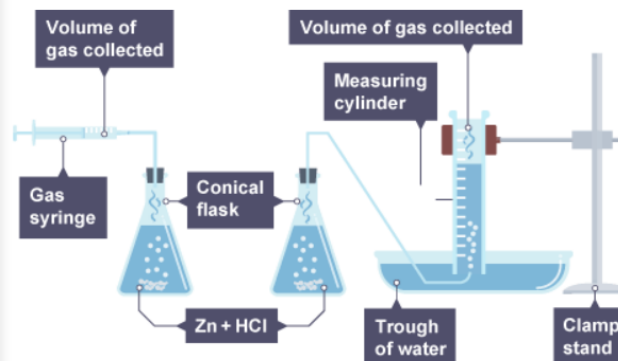
The change in **mass** of a reactant or product can be followed during a reaction. This method is useful when carbon dioxide is a product which leaves the reaction container. It is not suitable for hydrogen and other gases with a small **relative formula mass**, M_r .

The units for rate are usually g/s or g/min.

Measuring volume

The change in **volume** of a reactant or product can be followed during a reaction. This method is useful when a gas leaves the reaction container. The volume of a gas is measured using a gas syringe, or an upside down **burette** or measuring cylinder.

The units for rate are usually $\text{cm}^3 \text{s}^{-1}$ or $\text{cm}^3 \text{min}^{-1}$.

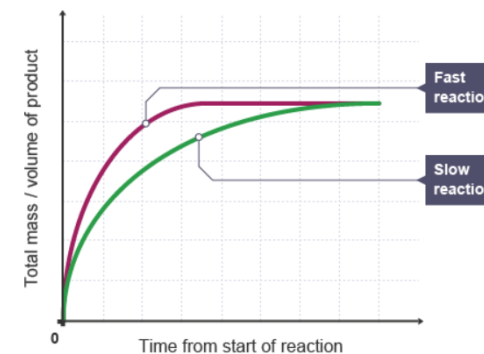


Two ways to measure the volume of a gas produced in a reaction

5

Graphs

The rate of reaction can be analysed by plotting a graph of mass or volume of product formed against time. The graph shows this for two reactions.



The steeper the line, the greater the rate of reaction. Faster reactions - where the line becomes horizontal - finish sooner than slower reactions

The **gradient** of the line is equal to the rate of reaction:

- the steeper the line, the greater the rate of reaction
- fast reactions - seen when the line becomes horizontal - finish sooner than slow reactions

Higher only

Units for rates of reaction - Higher

The rate of a chemical reaction can also be measured in Mol s^{-1} .

Tangents can also be drawn at other points on the graph. As the reaction carries on, the steepness of the tangent to the curve decreases (eg the blue dashed line) so the reaction is slowing down.

6

Further reading

[The rate and extent of chemical change - GCSE Combined Science Revision - AQA Trilogy - BBC Bitesize](#)

Year 11 Science Knowledge Organiser Learning Cycle 2 - Rates of reaction

1

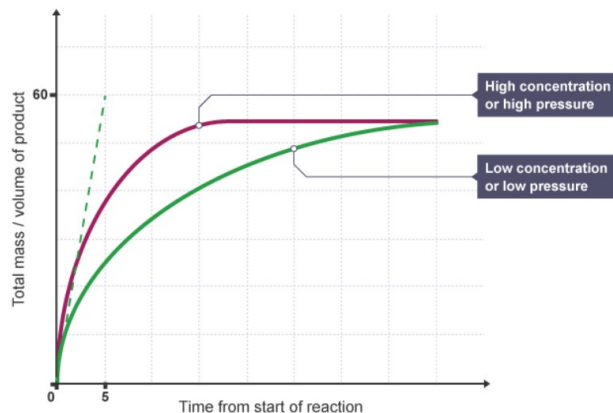
Calculating the gradient (Higher only)

Calculating the rate of reaction from the gradient of a tangent

To calculate the rate at the start of a reaction, you need to find the mathematical gradient (steepness) of the gradient. Use this equation:

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

For example, using the green tangent below:



The green tangent shows lower pressure

Higher only

[The rate and extent of chemical change - GCSE Combined Science Revision - AQA Trilogy - BBC Bitesize](#)

2

Catalysts

A **catalyst** is a substance that:

- increases the rate of a reaction
- does not alter the **products** of the reaction
- is not chemically changed or used up at the end of the reaction

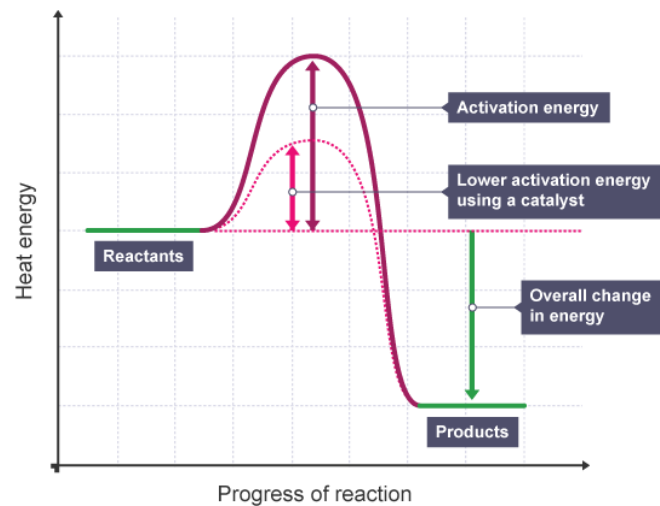
Only a very small mass of catalyst is needed to increase the rate of a reaction. However, not all reactions have suitable catalysts. Different substances catalyse different reactions.

Catalysts in biological reactions are called **enzymes**. Catalysts do not appear in the overall chemical equation for a reaction.

How catalysts work

A catalyst provides an alternative **reaction pathway** that has a lower **activation energy** than the uncatalysed reaction. This does not change the frequency of collisions. However, it does increase the frequency of successful collisions because more particles have energy greater than the activation energy, therefore there are more successful collisions.

The effect of a catalyst on the activation energy is shown on a chart called a **reaction profile**. This shows how the **energy** of the **reactants** and products change during a reaction.



3

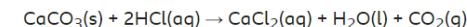
Required practical

Aims

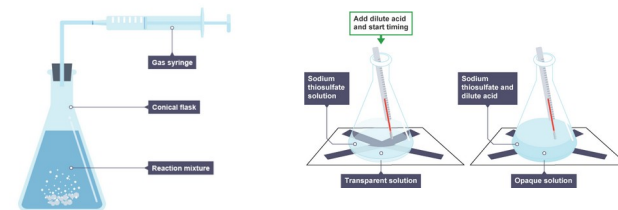
To investigate the effect of changing the concentration on the rate of a reaction.

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.

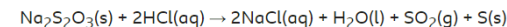


Aims

To investigate the effect of changing the temperature on the rate of a reaction.

Sodium thiosulfate solution reacts with dilute hydrochloric acid:

sodium thiosulfate + hydrochloric acid → sodium chloride + water + sulfur dioxide + sulfur



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 time.

Year 11 Science Knowledge Organiser Learning Cycle 2 - Homeostasis and response

1 Key words	Definition
Effector	The organ, tissue or cell that produces a response
Receptors	Organs which recognize and respond to stimuli
Reflex action	Automatic and rapid response to a stimulus
Stimulus	A change in environment that sets off a reaction in the nervous system, for example, light, heat, sound and smell.
Synapse	A gap at the junction between two nerve cells, which nerve signals must cross.
Gland	An organ or tissue that makes a substance for release, such as a hormone.
Hormone	Chemical messenger produced in glands and carried by the blood to specific organs in the body
Negative feedback	A mechanism where changes to conditions cause an action to reverse the change, to keep conditions stable
IVF	In vitro fertilization. This involves bringing the sperm and egg together to create an embryo, which is placed into the womb.

2 The nervous system

A Dendron
B Nucleus
C Axon
D Nerve ending
E Cytoplasm
F Cell membrane

Receptors (eg sense organs)
Sensory neurones
CNS
Relay neurones
Motor neurones
Effectors (eg muscles, glands)

All information resourced from BBC bitesize

3 The endocrine system

Conditions in the body change from set point
Change detected
Corrective mechanisms activated
Corrective mechanisms switched off
Conditions returned to set point

Pituitary gland
The 'master gland', situated at the base of the brain

Thyroid gland
Produces thyroxine

Pancreas
Produces insulin

Testes
Produce testosterone

Adrenal glands
Produce adrenaline

Ovaries
Produce oestrogen

4 Glucose regulation and diabetes

High levels of glucose
Low levels of glucose

Consuming sugary or starchy food
High blood sugar – insulin released
Glucose taken into cells and used or stored as glycogen
Optimal blood sugar level
Exercising/not eating for a while
Low blood sugar – glucagon released
Glycogen turned back into glucose in the liver and released into the bloodstream

Action of insulin

	Low glucose	High glucose
Effect on pancreas	Insulin not secreted into the blood	Insulin secreted into the blood
Effect on liver	Does not convert glucose into glycogen	Converts glucose into glycogen
Effect on blood glucose level	Increases	Decreases

5 Hormones in reproduction, contraception and infertility

Oestrogen **FSH** **LH**

Hormone	Produced	Role
FSH (follicle stimulating hormone)	Pituitary gland	Causes an egg to mature in an ovary. Stimulates the ovaries to release oestrogen
Oestrogen	Ovaries	Stops FSH being produced (so that only one egg matures in a cycle). Repairs, thickens and maintains the uterus lining. Stimulates the pituitary gland to release LH.
LH (luteinising hormone)	Pituitary gland	Triggers ovulation (the release of a mature egg)
Progesterone	Ovaries	Maintains the lining of the uterus during the middle part of the menstrual cycle and during pregnancy.

6 Further reading

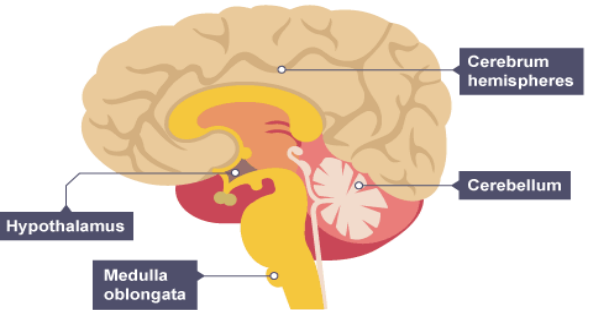
<https://www.bbc.co.uk/bitesize/guides/zt2yxfr/revision/1>

Year 11 Science Knowledge Organiser Learning Cycle 2 - Homeostasis and response (Triple science only)

1	Key words	Definition
	Brain	The organ of the central nervous system of mammals where vital functions are coordinated
	Neurones	Nerve cells. They carry an electrical message or impulse when stimulated
	Hypothalamus	The part of the brain that detects changes in blood temperature and water concentration
	Cerebrum	The part of the brain that controls intelligence, personality, conscious thought and high-level functions such as language and verbal memory
	Cerebellum	Controls balance, co-ordination of movement and muscular activity
	Medulla	Controls unconscious activities such as heart rate and breathing rates
	MRI	Magnetic resonance imaging - computer that scans the human body using magnetic fields and radio waves

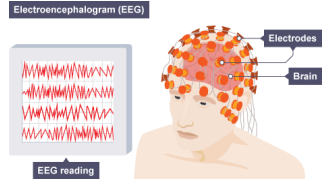
2 The brain

The **brain** controls complex behaviour. It is made of billions of interconnected **neurones** and has different regions that carry out different functions.




All information resourced from BBC bitesize

3 Investigating the brain - Higher



Electrical stimulation

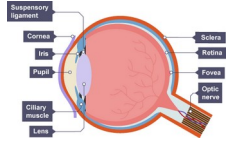
Scientists have stimulated different parts of the brain with a weak electrical current and asked patients to describe what they experienced. If the motor area is stimulated, the patient makes an involuntary movement. If the visual area is stimulated, they may see a flash of colour. EEGs (Electroencephalograms) can be created and studied, to observe the electrical activity in the brain.



MRI brain scans

Modern imaging methods such as MRI (Magnetic Resonance Imaging) scans, use strong magnetic fields and radio waves to show details of brain structure and function. Patients are asked to perform various tasks and, by looking at the scan, scientists can see which parts of the brain are active when the task is carried out.

5 The eye



Structure	Function
Cornea	Refracts light - bends it as it enters the eye
Iris	Controls how much light enters the pupil
Lens	Further refracts light to focus it onto the retina
Retina	Contains the light receptors
Optic nerve	Carries impulses between the eye and the brain
Sclera	Tough white outer layer of the eye. It helps protect the eye from injury

How the eye works - Higher

Accommodation is the process of changing the shape of the lens to focus on near or distant objects.

To focus on a **near** object - the lens becomes **thicker**, this allows the light rays to refract (bend) more strongly.

To focus on a **distant** object - the lens is pulled **thin**, this allows the light rays to refract slightly.

Position	Ciliary muscles	Suspensory ligaments	Muscle tension	Lens shape	Refraction
Near	Contract	Slacken/loosen	Low	Fat/thicker	Light is refracted strongly
Distant	Relax	Stretched/tighten	High	Thin	Light is only refracted slightly

Long-sight

Someone who is **long-sighted** can see distant objects clearly, but they cannot focus properly on near objects.

Long-sightedness is caused by one of the following:

- the eyeball being too short - so the distance between the lens and retina is too small
- a loss of elasticity in the lens - meaning it cannot become thick enough to focus (which is often age-related)

Short sight

Someone with **short-sight** can see near objects clearly, but cannot focus properly on distant objects.

Short sight is caused by one of the following:

- The eyeball being elongated - so that the distance between the lens and the retina is too great.
- The lens being too thick and curved - so that light is focused in front of the retina.

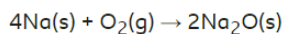
Year 11 Science Knowledge Organiser Learning Cycle 2 - Using resources (Triple Science only)

1 Key words	Definition
Corrosion	When chemicals in the water dissolve minerals in the rocks, causing them to break up (also called solution)
Rusting	An example of corrosion. It occurs when iron or steel react with oxygen and water
Reactive	The tendency of a substance to undergo a chemical reaction
Desiccant	A substance that absorbs water vapour and keeps a metal dry
Electroplating	Involves the use of electrolysis to put a thin layer of a metal on the object
Sacrificial metal	A more reactive metal than iron, attached to an iron or steel object to prevent the object rusting
Galvanisation	Coating iron or steel with a layer of zinc to prevent rusting

2 Corrosion

Metals can **oxidise** in air. They react with oxygen and form metal oxides. For example, sodium is a very **reactive** metal. When sodium is cut or scratched, its freshly exposed shiny surface rapidly turns dull as a thin layer of sodium oxide forms:

sodium + oxygen → sodium oxide



Other metals may oxidise more slowly. Gold and other very unreactive metals do not oxidise in air at all.

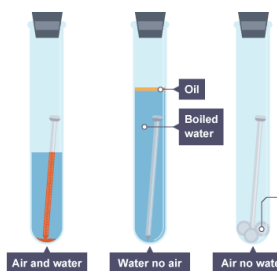
Corrosion happens when a metal continues to oxidise. The metal becomes weaker over time and eventually all of it may become metal oxide.

3 Rusting

Rusting is an example of corrosion. It occurs when iron or steel reacts with oxygen and water:

iron + oxygen + water → hydrated iron(III) oxide

Hydrated iron(III) oxide is the orange-brown substance seen on the surface of rusty objects.



The nail only rusts in the left-hand test tube. It does not rust:

- in the middle test tube, where there was water but no oxygen (because there was no air in the water)
- in the right-hand test tube, where there was oxygen (air) but no water

4 Preventing corrosion

Rusting can be prevented by keeping oxygen or water away from the iron or steel:

- oxygen can be excluded by storing the **metal** in an atmosphere of **unreactive** nitrogen or argon

A **desiccant** is a substance that absorbs water **vapour**, so it keeps the metal dry.

Physical barriers to oxygen and water

Many methods of rust prevention rely on creating a physical barrier to oxygen and water. These include:

- painting
- oiling and greasing
- coating with plastic

Different methods are used depending on the situation.

5 Electroplating

Electroplating involves using **electrolysis** to put a thin layer of a metal on the object:

- the **cathode** is the iron or steel object
- the **anode** is the plating metal
- the **electrolyte** contains **ions** of the plating metal

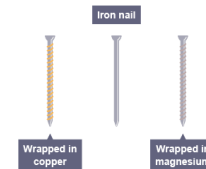
For example, steel cutlery can be electroplated with silver using a silver anode and silver nitrate solution. Electroplating improves the **corrosion** resistance of metal objects.

Sacrificial protection

Iron can be protected from rusting if it is in contact with a more **reactive** metal, such as zinc. The more reactive metal **oxidises** more readily than iron, so it 'sacrifices' itself while the iron does not rust. Once the **sacrificial metal** has corroded away, it can simply be replaced.

Worked example

Three nails are left in contact with air and water for a few days. A nail wrapped in magnesium does not rust. A nail alone rusts but a nail wrapped in copper rusts more. Explain these observations.



Galvanising

When iron is coated in zinc, the process is called **galvanisation**. The zinc layer stops oxygen and water reaching the iron. Zinc is more reactive than iron, so it also acts as a sacrificial metal. This protection works, even if the zinc layer is scratched.

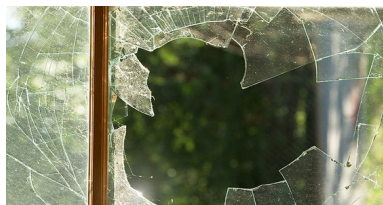
6 Further reading

[Using resources - GCSE Chemistry \(Single Science\) Revision - AQA - BBC Bitesize](#)

Year 11 Science Knowledge Organiser Learning Cycle 2 - Using resources (Triple Science only)

1 Key words	Definition
Transparent	Able to see through
Brittle	Easily broken
Crystals	A solid containing particles joined together to form a regular arrangement or repeating pattern
Opaque	Not transparent or see-through
Polymers	A large molecule formed from many identical smaller molecules known as monomers
Monomers	A small molecule, usually containing a C=C bond, that can join end to end with other monomers to form a polymer molecule
Composite	A material made from two or more different materials with contrasting properties

2 Glass



Most of the glass we use is soda-lime glass. This is made by melting a mixture of sand (silicon oxide), sodium carbonate and limestone, then allowing the **molten** liquid to cool and solidify.

Borosilicate glass is made by heating sand with boron trioxide. Borosilicate glass has a much higher melting point than soda-lime glass.

3 Clay ceramics



Clay ceramics include brick, china and porcelain. They are made by shaping wet clay and then heating it to a high temperature in a furnace, which causes **crystals** to form and join together.

Clay ceramics are often coated with a glaze, which hardens on heating to form a hard, smooth, **opaque** and waterproof layer. This explains why they are often used for dinner plates and bowls.

4 Preventing corrosion

Rusting can be prevented by keeping oxygen or water away from the iron or steel:

- oxygen can be excluded by storing the **metal** in an atmosphere of **unreactive** nitrogen or argon

A **desiccant** is a substance that absorbs water **vapour**, so it keeps the metal dry.

Physical barriers to oxygen and water

Many methods of rust prevention rely on creating a physical barrier to oxygen and water. These include:

- painting
- oiling and greasing
- coating with plastic

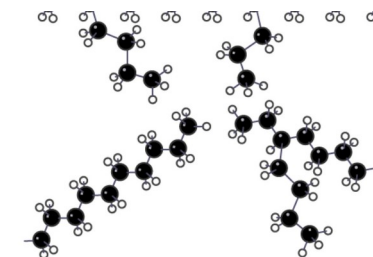
Different methods are used depending on the situation.

5 Polymers

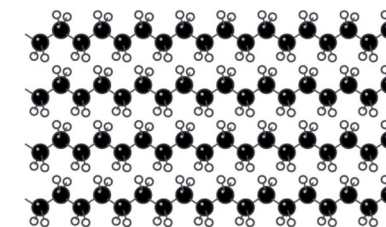
Different polymers have different **properties**, depending on the monomers they are made from and the conditions under which these monomers were joined together. This means that different polymers have different uses. For example, poly(ethene) can be made in low **density** and high density forms.

Polymer	Properties	Uses
Low density poly(ethene), LDPE	Flexible, unreactive, can be made into films	Most carrier bags, bubble wrap
High density poly(ethene), HDPE	Strong, flexible, resists shattering, resists chemical attack	Plastic bottles, pipes, buckets

Low density poly(ethene) has a structure where the polymer chains are branched and this means that the **molecules** are arranged randomly. High density poly(ethene) has less branching of the polymer chains, so the molecules line up much more closely.



Structure of a low density poly(ethene)



Structure of a high density poly(ethene)

6 Further reading

[Using resources - GCSE Chemistry \(Single Science\) Revision - AQA - BBC Bitesize](#)

Year 11 Science Knowledge Organiser Learning Cycle 2 - Chemical analysis

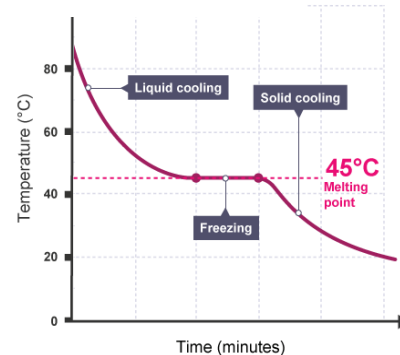
1 Key words	Definition
Pure	A substance that consists of only one element or only one compound
Mixture	Consists of two or more elements not chemically combined together
Melting point	The temperature at which a solid changes into a liquid as it is heated
Formulation	A mixture which has been designed as a useful product e.g. fertilisers, alloys, foods, paints
Chromatography	Used to separate mixtures of soluble substances
Soluble	Able to dissolve in solvent. E.g. sugar in water

2 Chemical substances

Description	Example	Diagram
Pure element	Oxygen	
Pure compound	Carbon dioxide	
Mixture of elements	Oxygen and helium	
Mixture of compounds	Alcohol and water	
Mixture of elements and compounds	Air	

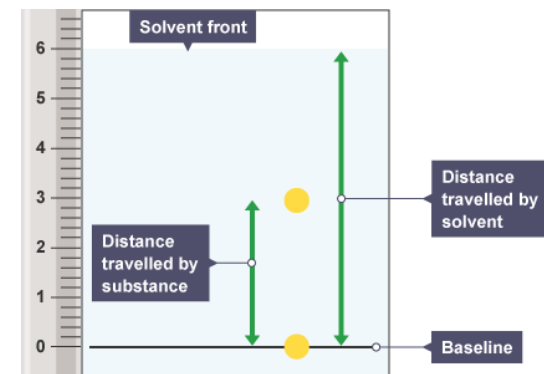
3 Pure substances and mixtures

Pure substances have a sharp **melting point** but mixtures **melt** over a range of temperatures. This difference is most easily seen when the temperature of a liquid is measured as it cools and **freezes**. The graph shows the cooling curve for a sample of a compound called salol.



5 Calculating R_f values

$$R_f = \frac{\text{distance travelled by substance}}{\text{distance travelled by solvent}}$$



2

4 Paper chromatography

Chromatography relies on two different 'phases':

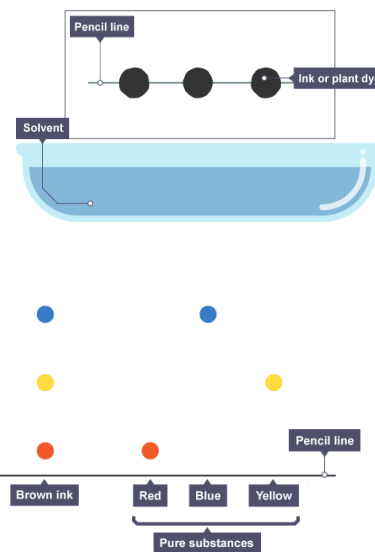
- the **mobile phase** is the **solvent** that moves through the paper, carrying different substances with it
- the **stationary phase** is contained on the paper and does not move through it

The different **dissolved** substances in a mixture are attracted to the two phases in different proportions. This causes them to move at different rates through the paper.

Interpreting a chromatogram

Separation by chromatography produces a **chromatogram**. A paper chromatogram can be used to distinguish between **pure** and **impure** substances:

- a pure substance produces one spot on the chromatogram
 - an impure substance produces two or more spots
- A paper chromatogram can also be used to identify substances by comparing them with known substances. Two substances are likely to be the same if:
- they produce the same number of spots, and these match in colour
 - the spots travel the same distance up the paper (have the same R_f value)



6 Testing for gases

Test	Observation	Inference
Glowing splint held in a test tube	Splint relights	Oxygen is present
Lighted splint held in a test tube	Pop sound heard	Hydrogen is present
Gas bubbled through limewater	Limewater turns milky or cloudy white	Carbon dioxide is present
Damp litmus paper held in a test tube	Paper turns white	Chlorine is present



7

Further reading

[Chemical analysis - GCSE Combined Science Revision - AQA Trilogy](#)
[y - BBC Bitesize](#)

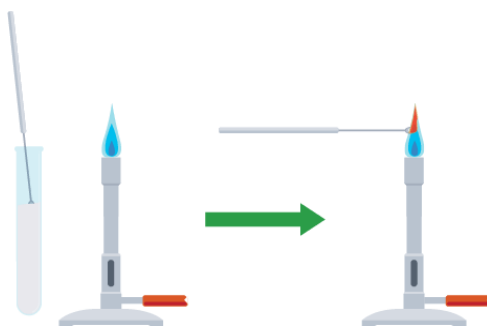
Year 11 Science Knowledge Organiser Learning Cycle 2 - Chemical analysis (Triple Science only)

1 Key words	Definition
Ions	Electrically charged particle, formed when an atom or molecule gains or loses electrons
Flame test	A qualitative identification technique where samples are heated and the metal ions present are identified by characteristic flame colours
Precipitate	A suspension of particles in a liquid formed when a dissolved substance reacts to form an insoluble substance, eg in a precipitation reaction
Spectroscopy	An instrument used to measure properties of light, usually to identify materials
Vaporised	To turn from a liquid to a gas or a vapour

2 Flame test for metal ions

To carry out a flame test:

- dip a clean wire loop into a solid sample of the compound being tested
- put the loop into the edge of the blue flame from a Bunsen burner
- observe and record the flame colour produced



All information resourced from BBC bitesize

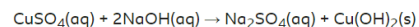
3 Metal cations

Ion present	Flame test colour
Lithium, Li ⁺	Crimson
Sodium, Na ⁺	Yellow
Potassium, K ⁺	Lilac
Calcium, Ca ²⁺	Orange-red
Copper, Cu ²⁺	Green

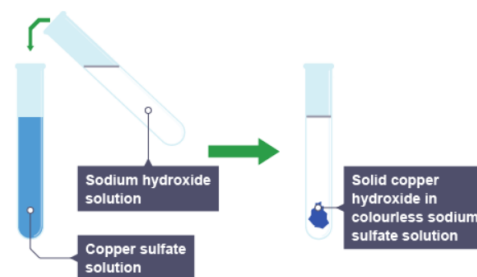
4 Metal hydroxide precipitate tests

Dilute sodium hydroxide solution is used in tests for some metal **ions**, which form metal hydroxides that are **insoluble**. This means that the metal hydroxides appear as **precipitates**. For example, copper sulfate solution reacts with a few drops of sodium hydroxide solution:

copper sulfate + sodium hydroxide → sodium sulfate + copper hydroxide



Copper hydroxide forms a blue precipitate.



Sodium hydroxide solution is added to copper sulfate solution. Solid copper hydroxide is produced in sodium sulfate solution

Metal ion	Precipitate colour
Aluminium, Al ³⁺	White
Calcium, Ca ²⁺	White
Magnesium, Mg ²⁺	White
Copper(II), Cu ²⁺	Blue
Iron(II), Fe ²⁺	Green
Iron(III), Fe ³⁺	Brown

5 Required practical

Test for carbonate ions

Add a few drops of dilute hydrochloric acid. Bubbles are produced if carbonate ions are present. Confirm that the gas is carbon dioxide - limewater turns milky/cloudy.

Test for sulfate ions

Add a few drops of dilute hydrochloric acid, then a few drops of barium chloride solution. A white precipitate forms if sulfate ions are present.

Test for halide ions

Add a few drops of dilute nitric acid, then a few drops of silver nitrate solution. Observe and record the colour of any precipitate formed.

6 Spectroscopy

Compared to simple laboratory tests, instrumental methods of analysis may give improved:

- speed**
- accuracy**
- sensitivity (they can detect very small amounts of a substance in a small amount of sample)

Flame emission spectroscopy

The flame emission **spectroscope** is a scientific instrument based on flame testing. **Data** from a spectroscope can be used to:

- Identify metal **ions** in a sample.
- Determine the **concentration** of metal ions in dilute **solutions**.

7 Further reading

[Instrumental methods of analysis - Analysing substances - AQA - GCSE Chemistry \(Single Science\) Revision - AQA - BBC Bitesize](#)

Year 11 Science Knowledge Organiser Learning Cycle 2 - Magnetism

1 Key words	Definition
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 Magnetic fields

A **magnet** can exert a force on another nearby magnet. Magnets have two poles:


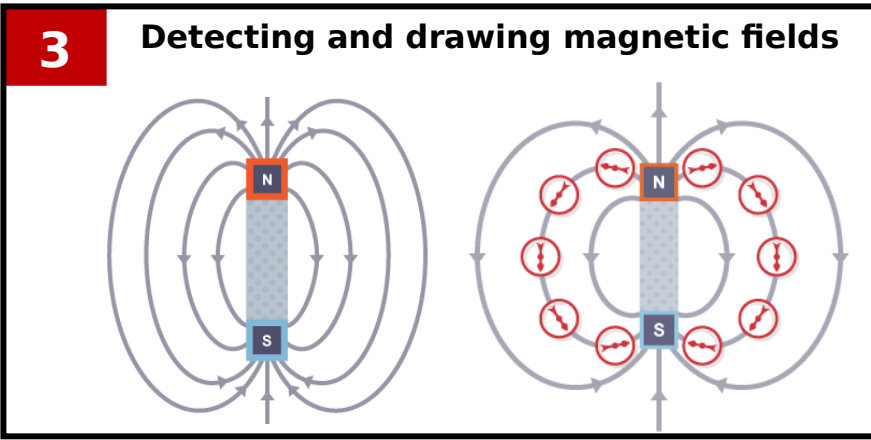
- a **north pole**
- a **south pole**

The **magnetic force** is the strongest

The rules of magnetism
Two magnets will either attract or repel each other in the following way:

- like poles (N-N or S-S) repel
- unlike poles (N-S or S-N) attract

Magnetic forces are **non-contact forces** - this means that magnets affect each other without touching.

4 Permanent and induced magnetism

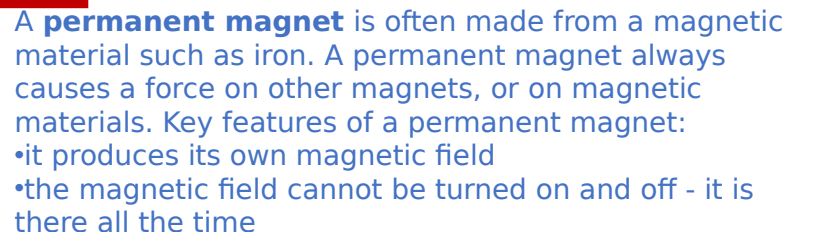

A **permanent magnet** is often made from a magnetic material such as iron. A permanent magnet always causes a force on other magnets, or on magnetic materials. Key features of a permanent magnet:

- it produces its own magnetic field
- the magnetic field cannot be turned on and off - it is there all the time

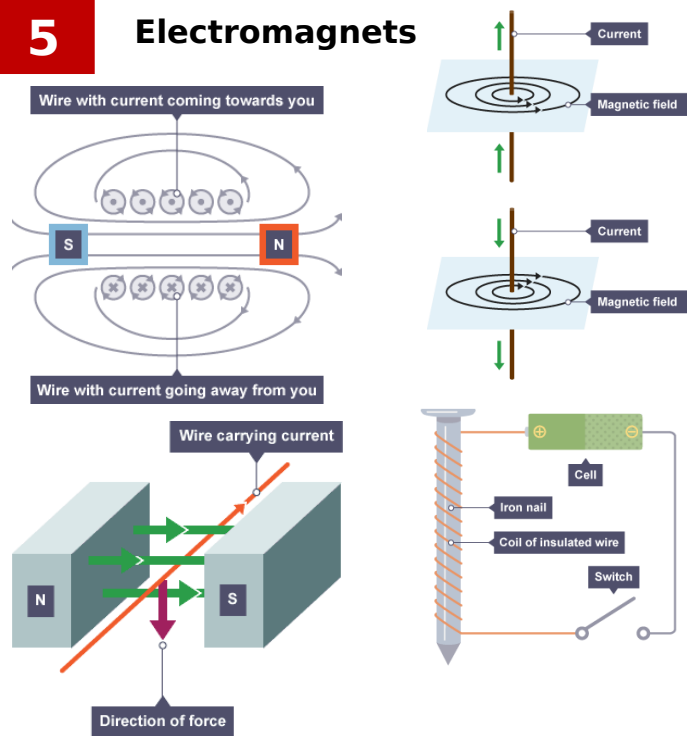
Bar magnets and horseshoe magnets are examples of permanent magnets.

Unlike a permanent magnet, an **induced magnet** only becomes a magnet when it is placed in a magnetic field. The induced magnetism is quickly lost when the magnet is removed from the magnetic field. In the image become induced magnets when they are near the bar magnet. Like all induced magnets:

- they are only attracted by other magnets, they are not repelled
- they lose most or all of their magnetism when they are removed from the magnetic field

5 Electromagnets



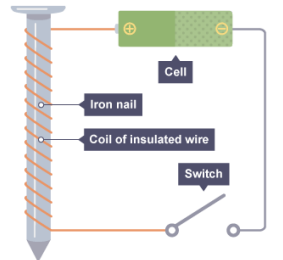
force = magnetic flux density × current × length

Higher only

$$F = B I l$$

This is when:

- F is force in newtons (N)
- B is magnetic flux density (magnetic field strength) in tesla (T)
- I is current in amperes - also referred to as amps - (A)
- l is length in metres (m)



6 Further reading

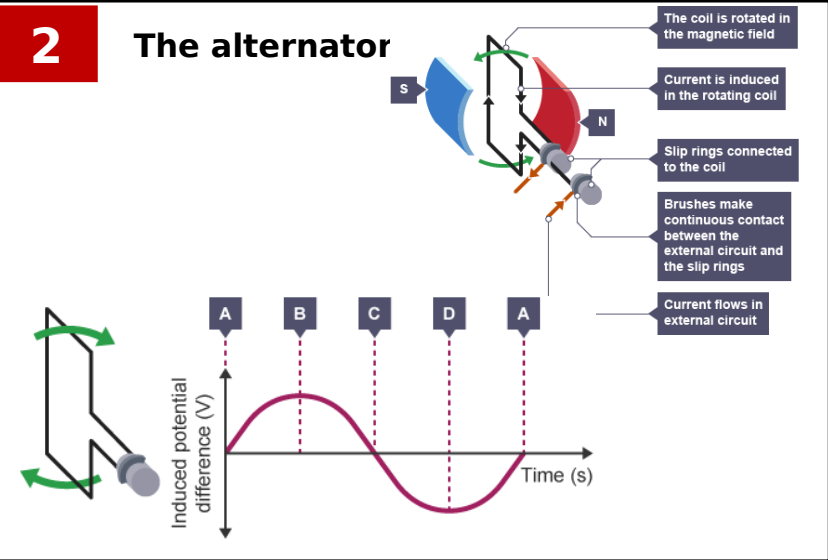
<https://www.bbc.co.uk/bitesize/topics/zkww6f>

Year 11 Science Knowledge Organiser Learning Cycle 2 - Magnetism (Triple Science only)

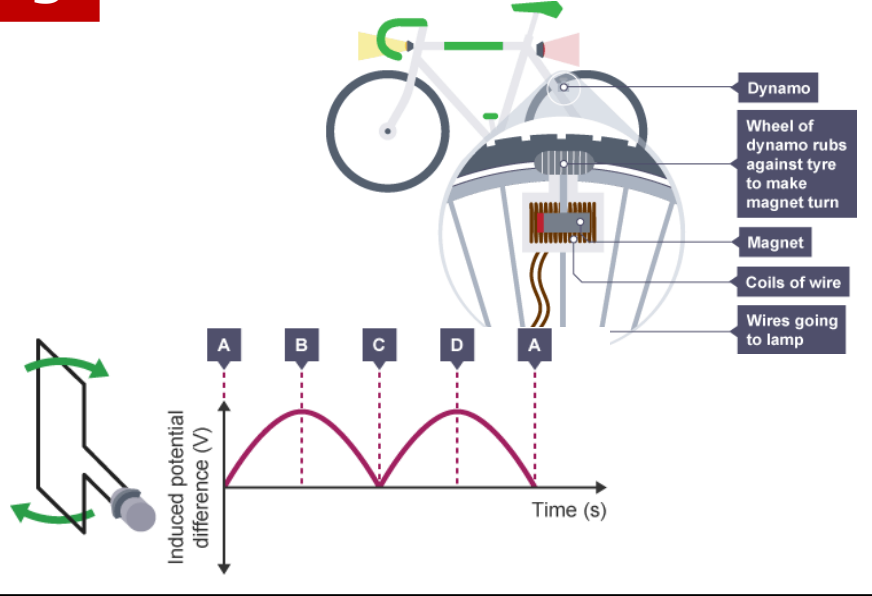
1 Key words

Key words	Definition
Generator	A device that converts kinetic energy into electrical energy
Alternator	An electrical generator which produces alternating current, an ac generator
Dynamo	An electrical generator which produces direct current, a dc generator
Moving -coil-microphone	A microphone in which electrical signals are produced when the pressure vibrations in sound waves vibrate a coil of wire within a magnetic field
Transformer	A device that can change the potential difference or voltage of an alternating current

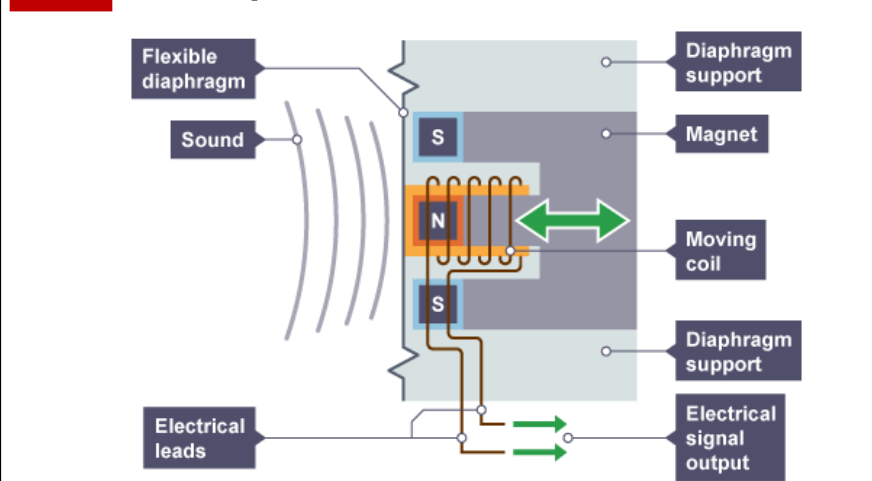
2 The alternator



3 The dc generator



4 Microphones



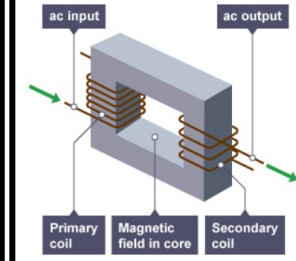
5 Transformers

Higher only

- a step-up transformer increases the voltage
- a step-down transformer reduces the voltage

Design and use of transformers

A basic transformer is made from two coils of wire, a primary coil from the alternating current (ac) input and a secondary coil leading to the ac output. The coils are not electrically connected. Instead, they are wound around an iron core. This is easily magnetised and can carry magnetic fields from the primary coil to the secondary coil.



The ratio of potential differences on the transformer coils matches the ratio of the numbers of turns on the coils.

This equation can be used to calculate what the output might be from a particular transformer, or to work out how to design a transformer to make a particular voltage change:

$$\frac{\text{primary voltage}}{\text{secondary voltage}} = \frac{\text{number of turns on primary coil}}{\text{number of turns on secondary coil}}$$

$$\frac{V_p}{V_s} = \frac{n_p}{n_s}$$

This is when:

- V_p is the potential difference in the primary (input) coil in volts (V)
 - V_s is the potential difference in the secondary (output) coil in volts (V)
 - n_p is the number of turns on the primary coil
 - n_s is the number of turn on the secondary coil
- In a step-up transformer, $V_s > V_p$. In a step-down transformer, $V_s < V_p$.

6 Further reading

[Magnetism and electromagnetism - GCSE Physics \(Single Science\) Revision - AQA - BBC Bitesize](#)

Year 11 Science Knowledge Organiser Learning Cycle 2 - Waves

1

Key words

Definition

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 direction in which the particles are vibrating

2

Wave period and wave speed

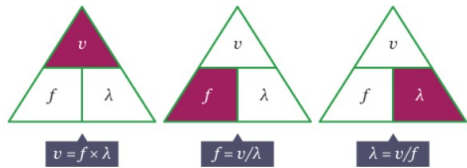
The speed of a wave can be calculated using the equation:

wave speed = frequency × wavelength

$$v = f \lambda$$

This is when:

- wave speed (v) is measured in metres per second (m/s)
- frequency (f) is measured in Hertz (Hz)
- wavelength (λ) is measured in metres (m)



The time period of a wave can be calculated using the equation:

$$\text{Time period} = \frac{1}{\text{frequency}}$$

$$T = \frac{1}{f}$$

This is when:

- the period (T) is measured in seconds (s)
- frequency (f) is measured in hertz (Hz)

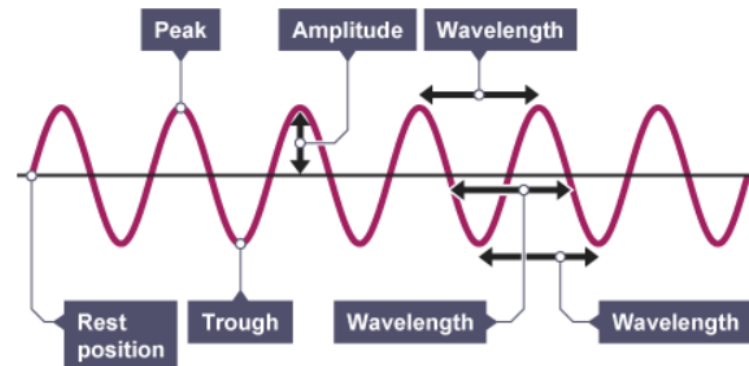
3

The parts of a wave

Waves are described using the following terms:

- **rest position** - the undisturbed position of particles or fields when they are not vibrating
- **displacement** - the distance that a certain point in the medium has moved from its rest position
- **peak** - the highest point above the rest position
- **trough** - the lowest point below the rest position
- **amplitude** - the maximum displacement of a point of a wave from its rest position
- **wavelength** - distance covered by a full cycle of the wave, usually measured from peak to peak, or trough to trough
- **time period** - the time taken for a full cycle of the wave, usually measured from peak to peak, or trough to trough
- **frequency** - the number of waves passing a point each second

Diagram of a wave



4

Measuring the speed of sound in air and water

The air is made up of many tiny particles. When sound is created, the air particles vibrate and collide with each other, causing the vibrations to pass between air particles. The vibrating particles pass the sound through to a person's ear and vibrate the ear drum.

Light travels much faster than sound through air. For example, a person fires a starting pistol and raises their hand in the air at the same time. A distant observer stood 400 metres (m) away records the time between seeing the action (the light reaches the time keeper immediately) and hearing the sound (which takes more time to cover the same distance).

The speed of sound can be calculated using the equation:

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

$$v = \frac{d}{t}$$

This is when:

- speed (v) is measured in metres per second (m/s)
- distance (s) is measured in metres (m)
- time (t) is measured in seconds (s)

5

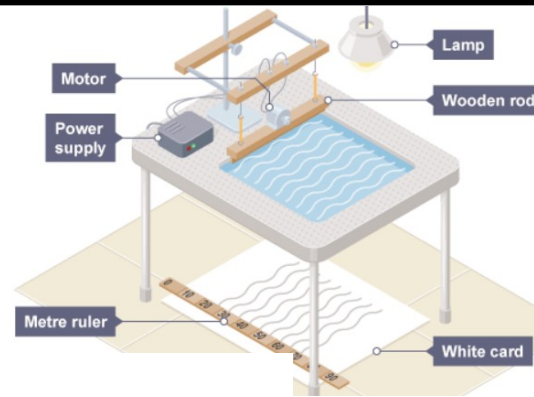
Further reading

[Waves - GCSE Combined Science Revision](#)
[- AQA Trilogy - BBC Bitesize](#)

Year 11 Science Knowledge Organiser Learning Cycle 2 - Waves

1 Required practical

A ripple tank can be used to measure and calculate frequency, wavelength and the speed of waves on the surface of the water. A ripple tank is a transparent shallow tray of water with a light shining down through it onto a white card below in order to clearly see the motion of the ripples created on the water's surface. Ripples can be made by hand but to generate regular ripples it is better to use a motor.



Aim of the experiment

To measure the frequency, wavelength and speed of waves in a ripple tank.

Method

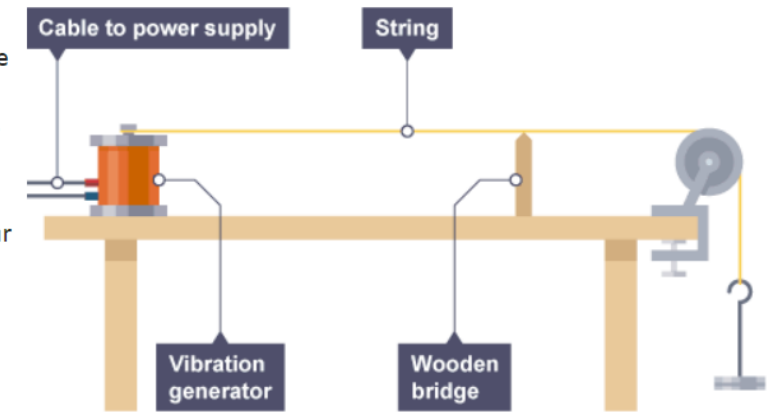
1. Set up the ripple tank as shown in the diagram with about 5 cm depth of water.
2. Adjust the height of the wooden rod so that it just touches the surface of the water.
3. Switch on the lamp and motor and adjust until low frequency waves can be clearly observed.
4. Measure the length of a number of waves then divide by the number of waves to record wavelength. It may be more practical to take a photograph of the card with the ruler and take measurements from the still picture.
5. Count the number of waves passing a point in ten seconds then divide by ten to record frequency.
6. Calculate the speed of the waves using: wave speed = frequency \times wavelength.

Aim of the experiment

To measure the frequency, wavelength and speed of waves in a string.

Method

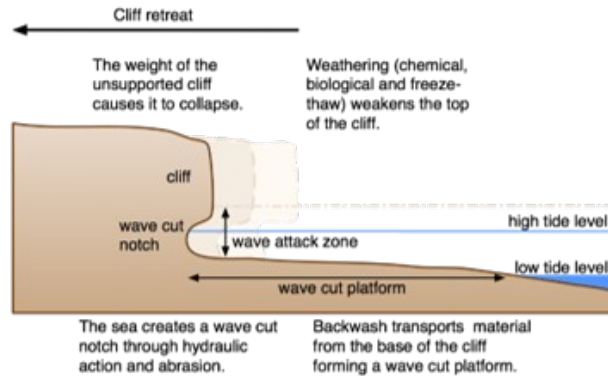
1. Attach a string or cord to a vibration generator and use a 200 gram (g) hanging mass and pulley to pull the string taut as shown in the diagram. Place a wooden bridge under the string near the pulley.
2. Switch on the vibration generator and adjust the wooden bridge until stationary waves can be clearly observed.
3. Measure the length of as many half wavelengths (loops) as possible, divide by the number of half wavelengths (loops). This is half the wavelength, doubling this gives the wavelength.
4. The frequency is the frequency of the power supply.
5. Calculate the speed of the waves using: wave speed = frequency \times wavelength.



Year 11 Geography Learning Cycle 2

1

Wave cut platform



2

Formation of a headland

Formation of Bays and Headlands

- Waves attack the coastline.
- Softer rock is eroded by the sea quicker forming a bay, calm area cases deposition.
- More resistant rock is left jutting out into the sea. This is a headland and is now more vulnerable to erosion.

3

Spit formation



- Longshore drift** moves material along the coastline.
- A **spit** forms when the material is deposited.
- Over time, the spit grows and develops a **hook** if wind direction changes further out.
- Waves cannot get past a spit, which creates a sheltered area where silt is deposited and mud flats or **salt marshes** form.

4

Waterfall formation

Upper Course of a River

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

- River flows over alternative types of rocks.
- River erodes soft rock faster creating a step.
- Further hydraulic action and abrasion form a plunge pool beneath.
- Hard rock above is undercut leaving cap rock which collapses providing more material for erosion.
- Waterfall retreats leaving steep sided gorge.

5

Levee formation

Formation of Floodplains and levees

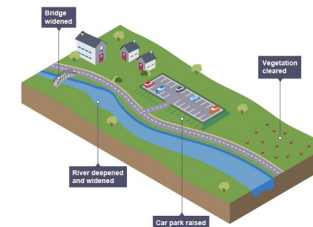
When a river floods, fine silt/alluvium is deposited on the valley floor. Closer to the river's banks, the heavier materials build up to form natural levees.

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

In between floods slow moving river deposits silt in riverbed.

6

River Management



River Management Schemes

Soft Engineering	Hard Engineering
<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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.

Year 11 History Learning Cycle 2

1 Impact on Plains Indians, c1862-1868

Cattle Industry: Cattle and buffalo competed for the same grass. This put pressure on the buffalo. Cattle also crossed Indian lands, leading to tension.

Impact of reservations: They undermined the Indians' traditional way of life and meant that Indians could not hunt. They became dependent on food supplies from the



2 Little Crow's War, 1862

Cause: Crops failed and Indians faced starvation.

Events: Little Crow and others attacked the agency. They stole food and killed several US soldiers.

Consequences: By October most Santee had surrendered or been captured. They were then moved to a smaller reservation, Crow Creek. Its barren landscape caused many deaths that winter.

3 The Battle of the Little Bighorn, 1876

Causes: The US Army was ordered to attack any Sioux Indians who had not returned to their reservations.

Events: There was no effective communication between the 3 columns of soldiers. General Custer disobeyed orders and arrived a day early by cutting across the mountains.

He then attacked despite warnings from his scouts (because he wanted glory). The Indians outnumbered them 2000 to 200 and had repeating rifles (better weapons).

4 Continued settlement and growth

The Exoduster Movement, 1879: 43,000 black migrants settled in Kansas due to a lack of equality in the southern states (after the Civil War slavery was abolished).

The Oklahoma Land Rush, 1893: Land that was previously seen as too dry for farming became available. Due to an economic depression, 100,000 people dashed to claim the land.



5 Lawlessness

Tensions in the West grew at this time

Billy the Kid: Billy's gang caused chaos in New Mexico in 1878.

Wyatt Earp: Became Deputy Sheriff in Tombstone in 1880. Earp and his brothers killed 2 McLaurys and 1 Clanton (ranchers in the area) at the OK Corral in 1886. This shows that law officers often committed crime themselves



6 The End of the Indians' Way of Life

The Ghost Dance: In 1890 the Indians were desperate due to lack of food. In response to a vision, many of them started a Ghost Dance. This worried the Indian agents and white settlers.

Wounded Knee Massacre, 1890: In response to the Ghost Dance, 250 Indians were killed in the last clash between the Sioux Indians and US Army.



Year 11 Spanish Knowledge Organiser Learning Cycle 2

1 Know your question words!

We've seen these before - but they are so important that we are going to check them again! These are all on Memrise as well for you to practise.

qué = what	cuánto = how much
cuál = which	cuántos = how many
dónde = where	cómo = how
adónde = where to	cómo es = what like
de dónde = where from	
cuándo = when	
quién = who	
con quién = with whom	
por qué = why	

2 Know the high-frequency vocab

In your Spanish Vocab Booklet, we have compiled a list of the high-frequency vocab that comes up all the time in the GCSE reading and listening exams

The more of this vocab that you know, the higher your mark will be.

Practise it regularly by self testing using one of the vocab learning techniques listed in box 3.
You can practise all of this on Memrise too!

3 Vocab learning

Regularly practise your topic specific vocabulary using the techniques listed below:

- Log into your Memrise Group and practise online

- Look-cover-write-check

This video demonstrates what to do:

<https://youtu.be/eKoOoW8PBc0>

- Use the Parallel text

This video demonstrates what to do:

<https://youtu.be/WcvVeNM6dWc>

Make Flashcards and self-test:

<https://youtu.be/-SL9037YMKA>

4 Target books

Last year you were all given Target Reading and Writing books, these are written by the exam board and are an invaluable resource when preparing for the GCSEs.

Complete a section of the book, check your answers in the back making note of your errors

Complete the over to you task, then ask your class teacher to check it.

5 Consolidate your tenses!

To be successful in the GCSE you need to be able to speak and write confidently in the past present and future tenses.

Follow this link to the BBC Bitesize grammar section, select the tenses that you feel least confident with and complete the activities

<https://www.bbc.co.uk/bitesize/topics/zvmxrf6>

Choose from:

Foundation: present, preterite, immediate future, conditional

Higher: all of the above and pure future (will), imperfect

6 Further reading, websites

Revision of Theme 1- Identity and Culture:

<https://www.bbc.co.uk/bitesize/topics/zdyvqp3>

<https://www.bbc.co.uk/bitesize/topics/zj3b2sg>

<https://www.bbc.co.uk/bitesize/topics/z7grxyc>

Revision of Theme 2- Local area, holidays and travel:

<https://www.bbc.co.uk/bitesize/topics/zmc4t39>

<https://www.bbc.co.uk/bitesize/topics/z69kpg8>

Revision of Theme 3- School:

<https://www.bbc.co.uk/bitesize/topics/zh8dscw>

Revision of Theme 4- Future aspirations, work and study: <https://www.bbc.co.uk/bitesize/topics/znwiy9q>

Revision of Theme 5- International and global dimension:

<https://www.bbc.co.uk/bitesize/topics/zfq7382>



Year 11 French Knowledge Organiser Learning Cycle 2

1 Know your question words!

We've seen these before - but they are so important that we are going to check them again! These are all on Memrise as well for you to practise.

qu'est-ce que = what

quel = which

où = where

d'où = where from

quand = when

qui = who

avec qui = with whom

pourquoi = why

combien = how much

combien de = how many

comment = how

comment est = what like

2 Know the high-frequency vocab

In your French Vocab Booklet, we have compiled a list of the high-frequency vocab that comes up all the time in the GCSE reading and listening exams

The more of this vocab that you know, the higher your mark will be.

Practise it regularly by self testing using one of the vocab learning techniques listed in box 3.

You can practise all of this on Memrise too!

3 Vocab learning

Regularly practise your topic specific vocabulary using the techniques listed below:

- Log into your Memrise Group and practise online

- Look-cover-write-check

This video demonstrates what to do:

<https://youtu.be/eKoOoW8PBc0>

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This video demonstrates what to do:

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Make Flashcards and self-test:

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Complete a section of the book, check your answers in the back making note of your errors

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Follow this link to the BBC Bitesize grammar section, select the tenses that you feel least confident with and complete the activities

<https://www.bbc.co.uk/bitesize/topics/zfs647h>

Choose from:

Foundation: present, perfect, near future, conditional

Higher: all of the above and pure future (will), imperfect

6 Further reading, websites

Revision of Theme 1- Identity and Culture:

<https://www.bbc.co.uk/bitesize/topics/zk9bmfr>

<https://www.bbc.co.uk/bitesize/topics/zd8r6v4>

<https://www.bbc.co.uk/bitesize/topics/zjw4hbk>

Revision of Theme 2- Local area, holidays and travel:

<https://www.bbc.co.uk/bitesize/topics/z7qknrd>

<https://www.bbc.co.uk/bitesize/topics/zm2df4j>

Revision of Theme 3- School:

<https://www.bbc.co.uk/bitesize/topics/z6xjvk7>

Revision of Theme 4- Future aspirations, work and study:

<https://www.bbc.co.uk/bitesize/topics/zht7bdm>

Revision of Theme 5- International and global dimension:

<https://www.bbc.co.uk/bitesize/topics/znpmrj6>



Year 11 Computer Science Knowledge Organiser Learning Cycle 2: Topic 1: Producing Robust Programs

1 Defensive Design

Protection against unexpected **user inputs** or **actions**,
user entering a letter where a number was expected

maintainability ensuring code is readable and understandable: use comments, indents, variable names.

Errors Minimising / removing bugs
Error Types
Syntax: errors - the writing of the code
Logic errors - output unexpected

2 Test Data

valid data - sensible, possible data that the program should accept and be able to process
extreme data - valid data that falls at the boundary of any possible ranges
invalid (erroneous) data - data that the program cannot process and should not accept

Example test table for 'Name'

Number	Input	Expected	Actual
1	Joe (Valid)	No error	
2	X (Extreme)	Re-enter	
3	12345 Invalid	Re-enter	

3 Testing types

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

Iterative testing is carried out while a program is being developed. The programmer writes a section of code (module) then tests it. The module may work fine, but more likely the programmer will amend or fix the code, and test it again. The process repeats (iterates) until the module works as intended.

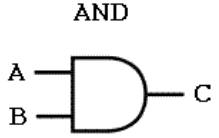
Final (terminal) testing is carried out when all modules are complete and the program is tested as a whole to ensure that it functions as it should.

1 Boolean Logic

Logic Diagrams Boolean Operators

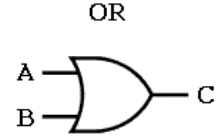
AND, OR, NOT Truth Tables

AND



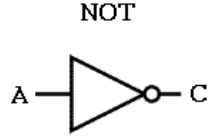
Inputs		Output
A	B	C
0	0	0
0	1	0
1	0	0
1	1	1

OR



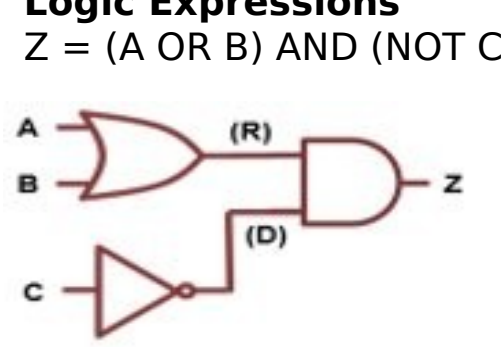
Inputs		Output
A	B	C
0	0	0
0	1	1
1	0	1
1	1	1

NOT



Input	Output
A	C
0	1
1	0

Logic Expressions $Z = (A \text{ OR } B) \text{ AND } (\text{NOT } C)$



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

1 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

Translating into Machine Code

- **Assembler** Translates each mnemonic and value into binary 1:1

LDA 51 → 101011001001
- **Compiler** Translates the entire program


- **Interpreter** Translates and executes one line at a time.
 Must be present to run the program

Integrated development environment (IDE) is used because:

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

Year 11 Learning Cycle 2 Art PPE Personal Learning Check lists

Exam Paper
out 14th
September
2022

Choose your Question. There are 7 questions. Read them all and use the powerpoint that was emailed to you, to look at the work of the artist, craftsperson and designers. Discuss the options with your teachers, friends and family.

Brainstorm. Take the title 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.

Artist Research. There will be 5 named artists, craftspeople or designers in the question. Look at the work of all 5 then select the three that you like the most. Produce a double page spread on each artist. Think about the presentation and most importantly include your written opinion and a copy of their work.

Brainstorm
& Artist
Research
complete.
October
2022

Completi
on of
Resource
material
and initial
idea
developm
ent
October
2022

Artist Research. You will have selected your idea and will now need to find an artist, craftsperson or designer that links 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.

Resource Material. Collect resource materials that links to your ideas. 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.

Second Brainstorm / Ideas Your ideas will have started to grow and develop from the moment you selected a question. Now you must evidence these ideas. You can do this by writing about them, drawing them or using collage. A second brainstorm is helpful at this point.

Development of Ideas & Contextualisation. You are now ready to refine your ideas. You might do this through drawing or writing. It is at this point that you must include a contextualisation link if you have not already done so. Split the page into 4 and sketch 4 different ideas, annotate and colour.

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 A4 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

Development
&
Contextualisat
ion November
2022

Experimentati
on. November
2022.

Final Idea.
November
2022

**GCSE PPE
Dates to be confirmed.**

Year 11 Engineering Knowledge Organiser Learning Cycle 2

1 Marking and measuring

Shaping

Turning

Turning is a machining process in which parts are created by cutting away unwanted material from a larger piece. Material is cut away as the **workpiece** is rotated at high speeds.

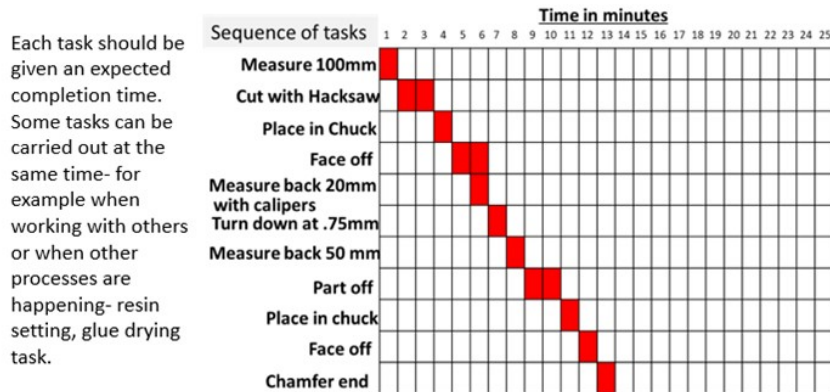
Turning refers to shaping material on a manual or automatic **lathe**. The lathe grips the material within a **chuck**, and a cutting tool, which can be of various shapes and sizes, is used to produce cylindrical shapes.

Many commercially turned items are produced on a **CNC** lathe that can be programmed to produce and then accurately reproduce particularly complex shapes time after time.

3 Polymer manufacturing

Planning using Gantt charts

A gantt chart lets you break tasks down into a sequence of smaller tasks. You can see the expected time each part of the sequence of tasks takes. The timescale could be seconds, weeks or even months/years according to the type of task.



You could also colour code to show different teams working together on a bigger project.

2

Milling

There are two types of milling machine – horizontal and vertical. Both are used to machine flat surfaces. They can also be used to create slots and **recesses**. A milling machine does this by using a rotating cutter with multiple teeth that removes material from the surface of the workpiece.

Vertical milling machines differ from horizontal ones in that they are fitted with cutters that have multiple cutting edges, and most feature CNC systems. Many commercially milled items are produced on a CNC milling machine – particularly complex shapes, which can be programmed and then accurately repeated time after time.

KEY TERM

Recesses are internal grooves, also known as pocket cuts.

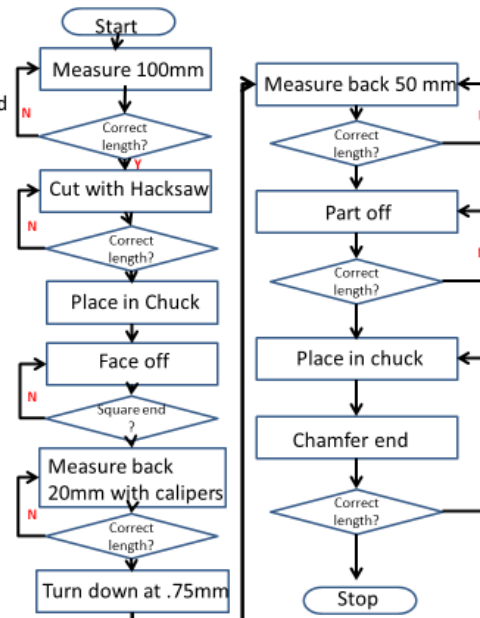
Planning using Flow charts

Planning can be carried out very efficiently using a flow chart. Flow charts are a very effective way of putting in place quality control checks and for describing **exactly** what needs to be done. Once the process is described and checked it is known as a **'standard operating procedure.'** The actions and checks require specific shapes to be used.

Any 'doing' action is shown in a rectangle

A quality control or decision is shown in a diamond.

You must always include options to go to another process or return to a previous process.



4

Marking and measuring tools:

Internal Callipers:

Measure internal sizes and diameters

External Callipers:

Measure external sizes and diameters

Odd Leg Callipers:

Mark a line parallel to an edge.

Engineers Square:

Marking out and checking 90 degrees.

Tap and Die:

Cutting internal and External Threads

Centre punch:

Creates an Indentation to locate drill point

Key terms:

Planning: Organising the sequence of designing and making tasks

Machining: Use lathes, drills and milling machines to make

Testing: Checking process to ensure components and products

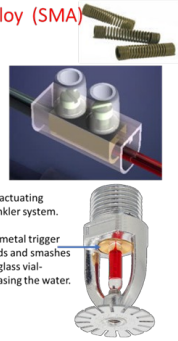
Year 11 Engineering Knowledge Organiser Learning Cycle 2

6

Smart Materials:

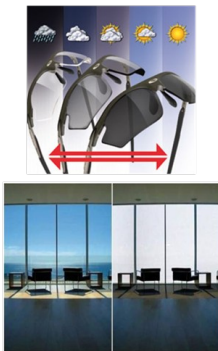
Smart Springs – Shape memory alloy (SMA)

- Made from any alloy of nickel/titanium
- At room temperature the spring is fully extended manually
- By heating up or applying a small electric current the spring will return to its original position and carry a load.
- Possible applications
- Emergency closer in case of fire of:
 - Bin lids
 - Blinds
 - windows



Photochromic Materials

- Materials that change colour when exposed to light
- Possible Applications:
 - energy-efficient windows that switch from transparent to opaque spontaneously upon exposure to increasing levels of sunlight
 - Sunglasses and visors that respond to changing conditions



Thermochromic Inks

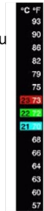
Inks that change colour with temperature



Has your egg been hot enough for long enough?



A 2d temperature gauge



Useful on marketing materials



Interesting gimmicks!



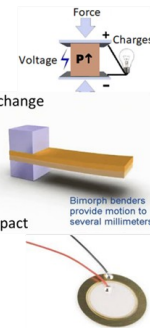
Piezoelectric Materials

• 2 unique properties

- When deformed, they generate a small but measurable electrical current.
- When an electrical current is applied, they change size
- up to a 4% change in volume

• Applications

- Sensors
- The airbag sensors in cars detect force of impact
- Buzzers
- Low quality speakers



7

Ferrous metals

Ferrous metals contain iron (see Table 2.1). This means they have greater magnetic properties than other materials. Iron in its pure form is a soft, grey material that is difficult to machine as it gives a poor surface finish and does not cast or forge well. The addition of carbon changes and improves its properties, allowing the production of steel and cast iron.

Ferrous metals – except for stainless steel – are also very vulnerable to rust when exposed to water or moisture.

Table 2.1: Some types of ferrous metal

Type	Properties	Composition (what it is made from)	Examples of use
Mild steel	<ul style="list-style-type: none"> • Tough • Ductile • Magnetic • Malleable 	<ul style="list-style-type: none"> • Iron • 0.1–0.3% carbon 	<ul style="list-style-type: none"> • Screws • Nails • Bolts
Cast iron	<ul style="list-style-type: none"> • Hard • Brittle • Magnetic 	<ul style="list-style-type: none"> • Iron • 2–4% carbon 	<ul style="list-style-type: none"> • Machine parts • Vices • Manhole covers
Stainless steel	<ul style="list-style-type: none"> • Hard • Tough • Sometimes magnetic • Difficult to cut 	<ul style="list-style-type: none"> • Alloy • 10.5% iron + carbon • 10.5–18% chromium • 8% nickel • 8% manganese 	<ul style="list-style-type: none"> • Cutlery • Sinks • Medical equipment

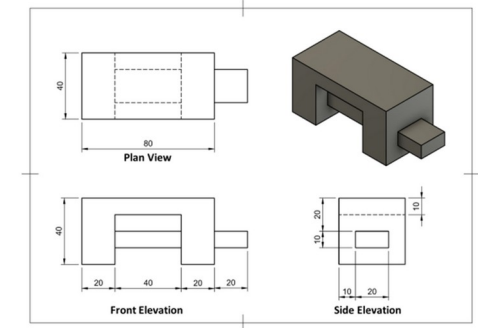
Non-ferrous metals

Non-ferrous metals are metals that do not contain iron. See Table 2.2 for examples of non-ferrous metals and some of their properties, composition and uses.

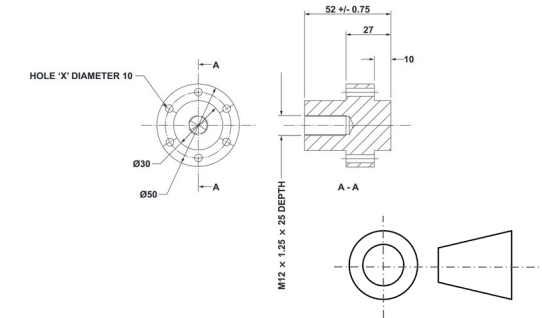
Type	Properties	Composition (what it is made from)	Examples of use
Aluminium	<ul style="list-style-type: none"> • Corrosion resistant • Malleable • Ductile • Easily machined 	<ul style="list-style-type: none"> • Pure metal 	<ul style="list-style-type: none"> • Aircraft • Foil • Drinks cans
Copper	<ul style="list-style-type: none"> • Corrosion resistant • Malleable • Ductile • Tough • Easily machined • Good electrical conductor 	<ul style="list-style-type: none"> • Pure metal 	<ul style="list-style-type: none"> • Electrical wires • Pipes
Brass	<ul style="list-style-type: none"> • Casts well • Harder than copper • Easily machined 	<ul style="list-style-type: none"> • Alloy • 65% copper • 35% zinc 	<ul style="list-style-type: none"> • Plumbing fittings • Door fittings • Locks • Musical instruments

9

Orthographic drawing:



(e) Below is an orthographic projection drawing of a coupling.



8

Fastening

Fastenings are non-permanent ways of joining two materials. Types of fastening include:

- screwed fastenings, like nuts, bolts, washers and screws
- pins and dowels.

One of the main things to remember when fitting a screwed fastener is how tight it should be and whether this tightness will be affected by any vibration.

Pins and dowels are used to hold parts together when very accurate locations are needed. For example, in a gearbox in a car, many parts need to be aligned exactly with others for the gearbox to work correctly. This is done using dowels, which maintain alignment, and bolts, which hold the parts together.



Different types of fastening

Key terms:

Properties: How a material performs its function and working characteristics

Application: How a material or processes is used

Dimension: Measurements between points and across shapes.

3rd Angle Orthographic- the layout of views on a technical drawing- Plan view and front and