Platanos College

Year 10

Spring Term

Essential Curriculum Checklist

What I need to ensure that I know…

Contents

How to use this guide

Children's education nationally has been negatively impacted by the coronavirus pandemic. Although we successfully delivered online live lessons, we have also recognised that pupils would like further guidance and web links to the essential topics across the curriculum.

What is the Essential Curriculum guide?

We have decided to compile a list of key learning topics for the Spring Term (January to April) for each subject.

This is intended to:

- Assist pupils who have missed lessons so that they can 'catch-up'
- Allow pupils to revise topics at home, using interactive learning resources (please paste the links into new web page to access the resource).

How many topics should I study and when?

This guide will help parents/ carers to support their children's learning at home. This can be done by:

- Agreeing two topics for one subject that pupils can study at home (approximately 1 hour)
- Agreeing two topics for one subject each weekend day
- Agreeing three topics for one subject per weekday in the holiday time

Please note that these times are suggestions only and are a way of helping parents/ carers support their child.

How can pupils organise themselves?

Some pupils may find it useful to create a timetable to assist with their planning for studying these topics. A blank timetable is available at the end of this guide.

Will my child be examined on these topics?

Parents/ carers will be informed about year 10 End of Year Formal Examinations in the Summer Term. Parents/ carers and pupils will receive Revision Guidance that will highlight topics that will be examined. It is likely that some of the topics in this Essential Curriculum guide will be examined.

English

Topic: An Inspector Calls

Aims:

- To know and understand the plot and context of the play An Inspector Calls
- To be able to identify a range of language and structural features used in the play and to practise analysing these in detail.

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
To know and to understand the context of the time period.	● The Sinking of the Titanic ● WWI (1914 – 1918) and the desire for Empire ● WWII (1939-1945) ● The Suffragette Movement and women gaining the vote (1918 – women over 30) ● Women taking on men's jobs during the war ● Edwardian Society: no security system, increased prosperity for industrialists and growing discontent among the working class. ● The Great Depression ● The Class Divide/ Social hierarchy: Working, Middle and Upper class. ● Strikes ● The introduction of the Welfare State: NHS, Education, council housing, fairer wages. ● Labour and Conservative government ● Priestley's life: he fought in WWI, he set up the Socialist Commonwealth Party, influential in developing the idea of the Welfare State.	Context https://classroom.thenational.academy/lessons/class-capitalism-and-socialism-1912-1946-6gr36c Context Revision https://www.bbc.co.uk/bitesize/guides/z2pc2hv/revision/7 Priestley's Background https://classroom.thenational.academy/lessons/priestleys-background-6thk4e	
To understand the plot of the play and the key themes	Key themes: ● Capitalism ● Socialism ● Class ● Age ● Responsibility	Key Themes https://classroom.thenational.academy/lessons/class-capitalism-and-socialism-1912-1946-6gr36c Themes https://www.bbc.co.uk/bitesize/guides/z	

	● Social Duty ● Time ● Gender	xcqycw/revision/5 Plot Summary https://www.bbc.co.uk/bitesize/guides/zxhsyrd/video	
To understand the form of the play and its key structural features.	Key features: ● Dramatic irony ● Stage Directions ● Lighting ● Props ● Costume ● Length of speech ● Prose ● Dashes and interruption ● Punctuation ● Exclamatory sentences ● Cliff-hangers ● Entrances ● Exits	Structure https://classroom.thenational.academy/lessons/staging-the-play-set-design-and-stage-directions-71k3cc Form, structure and language https://www.bbc.co.uk/bitesize/guides/z2w6rdm/revision/1	
To understand and be able to identify a range of language features used by Priestley	Key features: ● Hyperbole ● Juxtaposition ● Simile ● Metaphor ● Repetition ● Consonance ● Repetition ● Euphemism ● Emotive language	Analysing language: https://www.bbc.co.uk/bitesize/guides/z2w6rdm/revision/3	
To know and understand a range	● Squiffy ● Impertinent		

of new vocabulary from the play, including:	● Dunne and H.G. Wells ● Honours List ● Infirmary ● Knighthood ● Left-wing ● Strike ● Socialism		
To understand the Marxist critical theory and apply the following key terms to analysis of the play.	● Bourgeoisie ● Capitalism ● Socialism ● Proletariat ● Profit ● Inequality ● Division ● Hierarchy ● social unrest ● production	Class Structure in An Inspector Calls: https://classroom.thenational.academy/lessons/challenging-class-and-gender-part-2-c4vkge	
To understand feminist theory according to Simone de Beauvoir and apply the following key terms to analysis of the play	● Dominant ● Ideologies ● Submissive ● Objectification ● Stereotypical ● Patriarchy ● Reinforce ● Subvert ● Gender ● Sex ● Autonomy ● Equality ● Liberation	Gender roles in An Inspector Calls https://classroom.thenational.academy/lessons/challenging-class-and-gender-part-1-64t3ar	
To understand and be able to analyse key scenes in the play and the features used to	● Mr Birling is the head of the Birling household. He has made himself very wealthy by being a 'hard-headed' businessman. He is an active member of the community in Brumley and thinks that he might be in the running for a Knighthood. . He is materialistic and possessive and also	Characters https://www.bbc.co.uk/bitesize/guides/zsvgcdm/revision/1 Introduction to characters	

develop plot and character.	has old fashioned views about women. Mr Birling represents capitalist ideologies; he believes in 'lower costs and high prices'. His role as a businessman sees him exploiting his labour force (the proletariat) in order to prosper himself. ● Inspector Goole. The Inspector investigates each family member one at a time and in doing so, reveals the consequences of their behaviour. By the end of the play it is revealed that he isn't actually an Inspector. It is not entirely clear who he is; Priestley leaves it up to the audience to decide. His name 'Goole' suggests a supernatural or ghost like element. He encourages the Birling family to take responsibility for their actions and for other members of society. He is Priestley's socialist mouthpiece and represents socialist ideologies. ● Eva Smith is a working class woman who is strong willed and believes in better treatment of the working class. She represents the proletariat and she is exploited as a worker and as a female. <u>Act 1</u> ● The Birling family celebrate Sheila and Gerald's engagement ● We discover Gerald did not go near Sheila one summer ● Mrs Birling tells Sheila she must get used to staying at home while her husband goes to work ● Eric appears drunk or 'squiffy' ● Mr Birling is happy because the marriage will combine his company with Croft's Ltd. for 'lower costs and higher prices'. ● Mr Birling makes several speeches as a 'hard-headed businessman' about their future. According to Birling, there will be now war, no Labour trouble and the Titanic is unsinkable. ● Gerald and Birling are left alone and Birling suggests he will soon be given a knighthood. He believes this will make Gerald's mother happier about the marriage. ● Eric returns to the room and Birling lectures both men about 'look[ing]	https://classroom.thenational.academy/lessons/character-introductions-c5h64t Mr Birling's perspective https://classroom.thenational.academy/lessons/mr-birlings-perspective-75k3ec Introduction to the Inspector https://classroom.thenational.academy/lessons/introduction-of-the-inspector-6gu3er Mr Birling's interrogation https://classroom.thenational.academy/lessons/mr-birlings-interrogation-cruk0r Sheila's interrogation https://classroom.thenational.academy/lessons/sheilas-interrogation-60vk0d How Sheila changes – structure https://classroom.thenational.academy/lessons/sheila-reflects-and-changes-c5h32d Gerald's interrogation https://classroom.thenational.academy/lessons/geralds-interrogation-6mv32c Mrs Birling and her children https://classroom.thenational.academy/lessons/mrs-birling-and-her-children-c5hp8c	

	after himself and his own'. ● Birling's capitalist speech is interrupted by the doorbell and the arrival of the inspector ● The Inspector announces the suicide of Eva Smith ● Birling explains that he fired Eva for leading a strike: 'She had too much to say [...] and she had to go'. Birling takes 'no responsibility' for her death ● Eric thinks her treatment is 'a shame' Eva was not given higher wages ● The inspector reveals that Eva struggled to find a new job but managed to get a job at Milwards ● Sheila admits that she had the girl fired for being 'impertinent' because she was jealous of how well Eva looked in her dress. ● Sheila suspects that Gerald knows Eva and questions him about it while the others are out of the room. Gerald tries to hide the information from the inspector but Sheila believed he already knows. <u>Act 2</u> ● Gerald explains to The Inspector that he had an affair with Eva, but hasn't seen her since he ended their relationship back in Autumn 1911. ● Sheila gives her engagement ring back to Gerald. ● The Inspector turns his attention to Mrs Sybil Birling, she confesses that she also had contact with Eva, but Eva gave herself a different name to Mrs Birling. ● Eva approached a charity chaired by Mrs Birling to ask for help. Eva was desperate and pregnant but help was refused by Mrs Birling because she was offended by the girl calling herself 'Mrs Birling'. She tells Eva that the baby's father should be made entirely responsible. She also tells Inspector Goole that the father should be held entirely responsible and should be made an example of. <u>Act 3</u> ● Eric is revealed as the father. He stole money from Mr Birling's office to	Mrs Birling blames the father. https://classroom.thenational.academy/lessons/mrs-birling-blames-the-father-cmvkcd Mrs Birling's interrogation. https://classroom.thenational.academy/lessons/mrs-birlings-interrogation-cmr6ac Eric's interrogation https://classroom.thenational.academy/lessons/erics-interrogation-6rrkcd The Inspector's final speech https://classroom.thenational.academy/lessons/the-inspectors-final-speech-74rkcc The family look to blame https://classroom.thenational.academy/lessons/the-family-look-to-blame-6gw34r	

	provide money to Eva. Eric is angry at his mother when he learns that she has refused to help Eva. ● The Inspector tells them that they are all partly to blame for Eva's death and warns them of the consequences of people not being responsible for each other, *"If men will not learn that lesson, when they will be taught it in fire and blood and anguish".* ● After Inspector Goole leaves, the family begin to suspect that he was not a genuine police inspector. A phone call to the Chief Constable confirms this. Next, they phone the infirmary to be informed that no suicide case has been brought in. ● Mr Birling, Mrs Birling and Gerald congratulate themselves that it was all a hoax and they continue can continue as before. This attitude upsets Sheila and Eric. ● The phone rings. Mr Birling announces to the family that a girl has just died on her way to the infirmary; a police inspector is coming to question them.	The Inspector's identity https://classroom.thenational.academy/lessons/the-inspectors-identity-6gvpcc Hope for the younger generation https://classroom.thenational.academy/lessons/hope-for-change-and-the-younger-generation-6grkge Collective social responsibility and class https://classroom.thenational.academy/lessons/collective-social-responsibility-and-class-cdgk2d Test https://www.bbc.co.uk/bitesize/guides/z27p9qt/test Sample Exam question: https://www.bbc.co.uk/bitesize/guides/z38xg82/revision/1	

Mathematics (Foundation)

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
Solving equations	● Rearrange simple linear equations. ● Solve simple linear equations. ● Solve two-step equations.	https://teachers.thenational.academy/lessons/forming-and-solving-linear-equations-1-ccvkcr https://teachers.thenational.academy/lessons/solving-two-step-equations-60tk8d	
Solving equations with brackets	● Solve linear equations with brackets. ● Solve equations with unknowns on both sides.	https://classroom.thenational.academy/lessons/solving-equations-with-brackets-6rt3ec?activity=video&step=1 https://classroom.thenational.academy/lessons/solving-equations-with-unknown-on-both-sides-6xgkar?activity=video&step=1	
Inequalities	● Use correct notation to show inclusive and exclusive inequalities. ● Solve simple linear inequalities. ● Write down whole numbers which satisfy an inequality. ● Represent inequalities on a number line. ● Solve two-sided inequalities.	https://classroom.thenational.academy/lessons/representing-inequalities-on-a-number-line-6cuk6t?activity=video&step=1 https://teachers.thenational.academy/lessons/representing-inequalities-on-a-number-line-6cuk6t https://teachers.thenational.academy/lessons/solve-inequalities-with-unknowns-on-both-sides-c4w30d	
Formulae	● Substitute values into formulae and solve equations. ● Change the subject of a formula. ● Know the difference between an expression, an equation, a formula and an identity.	https://teachers.thenational.academy/lessons/substitute-a-positive-term-into-a-formula-cdgkge https://teachers.thenational.academy/lessons/substitute-a-negative-term-into-a-formula-75j3cc https://classroom.thenational.academy/lessons/change-the-subject-of-a-formula-6hhp2t?activity=video&step=1	
Using the nth term of a sequence	● Find the nth term of an arithmetic sequence.	https://classroom.thenational.academy/lessons/the-nth-term-rule-position-to-term-for-arithmetic-sequences-65h3gr?activity=video&step=2	
Properties of shapes	● Identify congruent shapes	https://teachers.thenational.academy/lessons/congruence-75gk0d	
Angles in parallel lines	● Find missing angles using corresponding and alternate angles.	https://classroom.thenational.academy/lessons/angles-on-parallel-lines-review-revisiting-alternate-and-corresponding-angles-c5j68r?activity=video&step=1	

Angles in triangles	● Understand angle proofs about triangles.	https://teachers.thenational.academy/lessons/angles-in-a-triangle-6gv38d	
Exterior and interior angles	● Calculate the interior and exterior angles of regular polygons.	https://classroom.thenational.academy/lessons/interior-angles-in-a-triangle-68uk0t?activity=video&step=1 https://classroom.thenational.academy/lessons/exterior-angles-c9jkce?activity=video&step=2	
Mean and range Mean and range	● Calculate the mean from a list and from a frequency table. ● Compare sets of data using the mean and range.	https://teachers.thenational.academy/lessons/mean-from-a-frequency-table-6thp2e	
Mode, median and range	● Find the mode, median and range from a stem and leaf diagram. ● Identify outliers. ● Estimate the range from a grouped frequency table.	https://classroom.thenational.academy/lessons/mean-from-a-grouped-frequency-table-65h6ad?activity=video&step=1	
Types of average	● Find the modal class. ● Find the median from a frequency table.	https://classroom.thenational.academy/lessons/median-from-frequency-tables-6rvp8d?activity=video&step=2	
Estimating the mean	● Estimate the mean of grouped data.	https://teachers.thenational.academy/lessons/mean-from-a-grouped-frequency-table-65h6ad	
Sampling	● Understand the need for sampling. ● Understand how to avoid bias.	https://teachers.thenational.academy/lessons/sampling-methods-chj6cr	
Rectangles, parallelograms and triangles	● Calculate the perimeter and area of rectangles, parallelograms and triangles.	https://teachers.thenational.academy/lessons/area-of-rectangles-parallelograms-and-triangles-71jp8c	
Area of compound shapes	● Calculate the perimeter and area of shapes made from triangles and rectangles.	https://teachers.thenational.academy/lessons/area-of-compound-shapes-65k64c	
Surface area of 3D solids	● Calculate the surface area of a cuboid. ● Calculate the surface area of a prism.	https://classroom.thenational.academy/lessons/3-d-shapes-crwp2c?activity=video&step=1	

Volume of prisms	● Calculate the volume of a cuboid. ● Calculate the volume of a prism.	https://teachers.thenational.academy/lessons/cuboids-cdjpae https://teachers.thenational.academy/lessons/volume-of-prisms-and-cylinders-6nhpat	

Mathematics (Higher)

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
Angle properties of triangles and quadrilaterals	● Derive and use the sum of angles in a triangle and in a quadrilateral. ● Derive and use the fact that the exterior angle of a triangle is equal to the sum of the two opposite interior angles.	https://www.drfrostmaths.com/videos.php?skid=130 https://www.drfrostmaths.com/videos.php?skid=170 https://www.drfrostmaths.com/videos.php?skid=133 https://www.drfrostmaths.com/videos.php?skid=133	
Interior angles of a polygon	● Calculate the sum of the interior angles of a polygon.	https://www.drfrostmaths.com/videos.php?skid=374	
Exterior angles of a polygon	● Know the sum of the exterior angles of a polygon.	https://www.drfrostmaths.com/videos.php?skid=374	
Pythagoras' theorem	● Calculate the length of the hypotenuse in a right-angled triangle. ● Solve problems using Pythagoras' theorem. ● Calculate the length of a shorter side in a right-angled triangle.	https://www.drfrostmaths.com/videos.php?vid=1 https://www.drfrostmaths.com/videos.php?skid=149	
Trigonometry	● Use trigonometric ratios to find lengths in a right-angled triangle. ● Use trigonometric ratios to calculate an angle in a right-angled triangle. ● Find angles of elevation and angles of depression. ● Know the exact values of the sine, cosine and tangent of some angles.	https://www.drfrostmaths.com/videos.php?skid=160 https://www.drfrostmaths.com/videos.php?skid=164	
Linear graphs	● Find the gradient and y-intercept from a linear equation.	https://www.drfrostmaths.com/videos.php?skid=99	

	● Rearrange an equation into the form y = mx + c. ● Sketch graphs using the gradient and intercepts. ● Find the equation of a line, given its gradient and one point on the line. ● Find the gradient of a line through two points.	Ixl: Y11- Linear functions – H.5, H.6, H.7, H.8, H.9 https://www.drfrostmaths.com/videos.php?skid=98 https://www.drfrostmaths.com/videos.php?mode=ks&permid=132	
Line segments	● Find the coordinates of the midpoint of a line segment. ● Find the gradient and length of a line segment. ● Find the equations of lines parallel or perpendicular to a given line.	https://classroom.thenational.academy/lessons/finding-midpoints-71k38d?activity=video&step=2 https://www.drfrostmaths.com/videos.php?skid=102	
Quadratic graphs	● Draw quadratic graphs. ● Solve quadratic equations using graphs.	https://www.drfrostmaths.com/videos.php?skid=117 https://www.drfrostmaths.com/videos.php?skid=205	
Cubic and reciprocal graphs	● Draw graphs of cubic functions. ● Solve cubic equations using graphs. ● Draw graphs of reciprocal functions.	https://www.drfrostmaths.com/videos.php?vid=11	
Perimeter and area	● Find the perimeter and area of compound shapes.	https://www.drfrostmaths.com/videos.php?skid=135	
Units and accuracy	● Calculate the maximum and minimum possible values of a measurement.	https://www.drfrostmaths.com/videos.php?skid=46 https://www.drfrostmaths.com/videos.php?skid=436	
Prisms	● Calculate volumes and surface areas of prisms.	https://www.drfrostmaths.com/videos.php?skid=125	

Circles	● Calculate the area and circumference of a circle.	https://www.drfrostmaths.com/videos.php?skid=138	
Sectors of circles	● Calculate arc lengths, angles and areas of sectors of circles.	https://www.drfrostmaths.com/videos.php?skid=417	
Cylinders and spheres	● Calculate volume and surface area of a cylinder and a sphere.	https://www.drfrostmaths.com/videos.php?skid=475 https://www.drfrostmaths.com/videos.php?skid=442 https://www.drfrostmaths.com/videos.php?skid=127	
Pyramids and cones	● Calculate volume and surface area of pyramids and cones.	https://www.drfrostmaths.com/videos.php?skid=127	
3D solids	● Draw plans and elevations of 3D solids.	https://www.drfrostmaths.com/videos.php?skid=451	
Reflection and rotation	● Reflect, rotate and describe reflections and rotations.	https://www.drfrostmaths.com/videos.php?skid=7 https://www.drfrostmaths.com/videos.php?skid=11 https://www.drfrostmaths.com/videos.php?skid=6	
Enlargement	● Enlarge shapes by fractional and negative scale factors about a centre of enlargement.	https://www.drfrostmaths.com/videos.php?skid=12	
Transformations and combinations of transformations	● Translate a shape using a vector. ● Carry out and describe combinations of transformations.	https://www.drfrostmaths.com/videos.php?skid=8	
Constructions	● Construct the perpendicular bisector of a line. ● Construct the shortest distance from a point to a line using a ruler and compasses. ● Bisect/Construct an angle using a ruler and compasses.	https://www.drfrostmaths.com/videos.php?skid=143 https://www.drfrostmaths.com/videos.php?skid=143	

Science – Triple

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
B3: Organisation and the digestive system	Tissues and organs ● Know that Cells are the basic building blocks of all living organisms. ● Know that a tissue is a group of cells with a similar structure and function. ● Know that organs are aggregations of tissues performing specific functions. ● Know that organs are organised into organ systems, which work together to form organisms.	https://www.youtube.com/watch?v=VO2QkpwAG9o	
	The human digestive system ● Identify some of the organs of the digestive system. ● State the function of some of the organs of the digestive system. ● State simply what happens to food during digestion. ● Name all of the organs of the digestive system. ● Describe the functions of the organs of the digestive system. ● Summarise the process of digestion. ● Link the process of digestion to other processes in the body in order to explain its function. ● Explain in detail how the small intestine is adapted to its function. ● Explain in detail what happens to food during digestion.	https://www.youtube.com/watch?v=4ui4oSHHnzA https://www.youtube.com/watch?v=vMI46qGQMDw	
	The chemistry of food ● Know that carbohydrase break down carbohydrates ● to simple sugars. Proteases break down proteins to amino acids. ● Lipases break down lipids (fats) to glycerol and fatty acids. The products of digestion are used to build new carbohydrates, lipids, and proteins. Some glucose is used in respiration. ● Required practical: Use qualitative reagents to test for a range of carbohydrates, lipids, and proteins. To include: Benedict's test for sugars; iodine test for starch; and Biuret reagent for protein.	https://teachers.thenational.academy/lessons/food-tests-61h3cd https://www.youtube.com/watch?v=5VW5-VXlWic https://www.youtube.com/watch?v=VLK2wANjQm0	
	Catalysts and enzymes	https://teachers.thenational.academy/lessons/digestive-enzymes-6dgkgr	

	● Relate knowledge of enzymes to metabolism. ● Carry out rate calculations for chemical reactions. ● Enzymes catalyse specific reactions in living organisms due to the shape of their active site. ● Use the 'lock and key theory' as a simplified model to explain enzyme action. ● Explain the importance of sugars, amino acids, fatty acids, and glycerol in the synthesis and breakdown of carbohydrates, proteins, and lipids. ● Know that Metabolism is the sum of all the reactions in a cell or the body. ● The energy transferred by respiration in cells is used by the organism for the continual enzyme-controlled processes of metabolism that synthesise new molecules.	https://www.youtube.com/watch?v=VNX9UQ08fZ4	
	Factors affecting enzyme action ● Describe the nature of enzyme molecules and relate their activity to temperature and pH changes	https://teachers.thenational.academy/lessons/investigating-enzymes-60w64t	
	How the digestive system works ● Pupils should be able to recall the sites of production and the action of amylase, proteases, and lipases. ● Pupils should be able to understand simple word equations, but no chemical symbol equations are required. ● Digestive enzymes convert food into small soluble molecules that can be absorbed into the bloodstream. ● Carbohydrase break down carbohydrates to simple sugars. ● Amylase is a carbohydrase which breaks down starch. ● Proteases break down proteins to amino acids. ● Lipases break down lipids (fats) to glycerol and fatty acids. ● Required practical: Investigate the effect of a factor on the rate of an enzyme-controlled reaction.	https://teachers.thenational.academy/lessons/digestion-cnk66c https://www.youtube.com/watch?v=6jz9WvfKDVc https://teachers.thenational.academy/lessons/absorption-74v38e https://teachers.thenational.academy/lessons/ph-and-enzymes-part-1-cru3jt https://teachers.thenational.academy/lessons/ph-and-enzymes-part-2-75h3gr https://www.youtube.com/watch?v=JyXXoevEWc8	

		https://www.youtube.com/watch?v=8Yqbu56ImXk&t=44s	
	Making digestion efficient ● Know that digestive enzymes convert food into small soluble substances that can be absorbed into the bloodstream. ● Explain that: Bile is made in the liver and stored in the gall bladder. It is alkaline to neutralise hydrochloric acid from the stomach. It also emulsifies fat to form small droplets which increases the ● surface area. The alkaline conditions and large surface area increase the rate of fat break down by lipase.	https://www.youtube.com/watch?v=VLK2wANjQm0	
B4: Organising animals and plants	The blood ● Know that blood is a tissue consisting of plasma, in which the red blood cells, white blood cells, and platelets are suspended. ● Know the functions of each of these blood components. ● Recognise different types of blood cells in a photograph or diagram and explain how they are adapted to their functions.	https://www.youtube.com/watch?v=nc_kbfjhiUo https://www.youtube.com/watch?v=81w0BXg7QJA	
	The blood vessels ● Know that the heart is an organ that pumps blood around the body in a double circulatory system. ● Know that the body contains three different types of blood vessel: • arteries • veins • capillaries. ● Explain how the structure of these vessels relates to their functions. ● Use simple compound measures such as rate and carry out rate calculations for blood flow	https://www.youtube.com/watch?v=AlSQEs694qY	
	The heart ● Know the structure and functioning of the human heart. ● Know that the heart is an organ that pumps blood around the body in a double circulatory system. The right ventricle pumps blood to the lungs where gas exchange takes place. The left ventricle pumps blood	https://www.youtube.com/watch?v=bpYaKM2hVFY https://teachers.thenational.academy/lessons/heart-rate-6cr32r	

	around the rest of the body. ● Knowledge of the blood vessels associated with the heart is limited to the aorta, vena cava, pulmonary artery, pulmonary vein, and coronary ● arteries. Knowledge of the names of the heart valves are not required. ● In coronary heart disease layers of fatty material build up inside the coronary arteries, narrowing them. This reduces the flow of blood ● through the coronary arteries, resulting in a lack of oxygen for the heart muscle. Stents are used to keep the coronary arteries open. Statins are widely used to reduce blood cholesterol levels which slows down the rate of fatty material deposit		
	Helping the heart ● The natural resting heart rate is controlled by a group of cells located in the right atrium that act as a pacemaker. Artificial pacemakers are electrical devices used to correct irregularities in the heart rate. ● Evaluate the advantages and disadvantages of treating cardiovascular diseases by drugs, mechanical devices, or transplant. In some people heart valves may become faulty, preventing the valve from opening fully, or the heart valve might develop a leak. ● Understand the consequences of faulty valves. Faulty heart valves can be replaced using biological or mechanical valves. In the case of heart failure, a donor heart, or heart and lungs can be transplanted. Artificial hearts are occasionally used to keep patients alive whilst waiting for a heart transplant, or to allow the heart to rest as an aid to recovery	https://teachers.thenational.academy/lessons/heart-disease-61k68d https://teachers.thenational.academy/lessons/heart-rate-6cr32r	
	Breathing and gas exchange ● Know the structure and functioning of the human lungs, including how lungs are adapted for gaseous exchange.	https://teachers.thenational.academy/lessons/the-lungs-ccu3ge	
	Tissues and organs in plants ● Explain how the structures of plant tissues are related to their functions. ● Plant tissues include: • epidermal tissues, which cover the plant • palisade mesophyll • spongy mesophyll • xylem and phloem • meristem tissue found at the growing tips of shoots and roots. Know	https://www.youtube.com/watch?v=2BR1zdMBhY4 https://www.youtube.com/watch?v=svCLQQwo5PU https://teachers.thenational.academy/lessons/plant-tissue-cnh32t	

	that the leaf is a plant organ. ● Knowledge limited to epidermis, palisade and spongy mesophyll, xylem and phloem, and guard cells surrounding stomata. ● Know that the roots, stem, and leaves form a plant organ system for transport of substances around the plant.		
	Transport systems in plants ● Explain how the structure of xylem and phloem are adapted to their function. Xylem tissue transports water and mineral ions from the roots to the stems and leaves. It is composed of hollow tubes strengthened by lignin adapted for the transport of water in the transpiration stream. ● Know that the Phloem tissue transports dissolved sugars from the leaves to the rest of the plant for immediate use or storage. The movement of food through phloem is called translocation. ● Know that the Phloem is composed of tubes of elongated cells. Cell sap can move from one phloem cell to the next through pores in the end walls. Detailed structure of phloem tissue or the mechanism of transport is not required.	https://teachers.thenational.academy/lessons/transport-in-plants-6rr38c	
	Evaporation and transpiration ● Know that the Xylem tissue transports water and mineral ions from the roots to the stems and leaves. It is composed of hollow tubes strengthened by lignin adapted for the transport of water in the transpiration stream. ● Explain the role of stomata and guard cells is in controlling gas exchange and water loss.	https://www.youtube.com/watch?v=9yTDokLRZs0 https://www.youtube.com/watch?v=Kf_efUdoADI	
	Factors affecting transpiration ● Explain the effect of changing temperature, humidity, air movement, and light intensity on the rate of transpiration. ● Understand and use simple compound measures such as the rate of transpiration. ● Know how to: • translate information between graphical and numerical form • plot and draw appropriate graphs, selecting appropriate scales for axes • extract and interpret information from graphs, charts and tables.	https://teachers.thenational.academy/lessons/investigating-transpiration-6tjk0r	

C4: Chemical calculations	Relative masses and moles ● The relative formula mass *M*r of a compound is the sum of the relative atomic masses of the atoms in the numbers shown in the formula. ● Chemical amounts are measured in moles. The symbol for the unit mole is mol. ● The mass of one mole of a substance in grams is numerically equal to its relative formula mass. ● One mole of a substance contains the same number of the stated particles, atoms, molecules, or ions as one mole of any other substance. ● The number of atoms, molecules, or ions in a mole of a given substance is the Avogadro constant. The value of the Avogadro constant is 6.02×10^{23} per mole. ● Pupils should understand that the measurement of amounts in moles can apply to atoms, molecules, ions, electrons, formulae, and equations, for example that in one mole of carbon, C, the number of atoms is the same as the number of molecules in one mole of carbon dioxide, CO_2. ● Pupils should be able to use the relative formula mass of a substance to calculate the number of moles in a given mass of that substance and vice versa.	https://teachers.thenational.academy/lessons/moles-and-avogadros-constant-ht-only-chj3jt https://www.youtube.com/watch?v=wPGVQu3UXpw	
	Equations and calculations ● The masses of reactants and products can be calculated from balanced symbol equations. ● Know how chemical equations can be interpreted in terms of moles. For example: $Mg + 2HCl \rightarrow MgCl_2 + H_2$: shows that one mole of magnesium reacts with two moles of hydrochloric acid to produce one mole of magnesium chloride and one mole of hydrogen gas. Pupils should be able to: • calculate the masses of substances shown in a balanced symbol	https://teachers.thenational.academy/lessons/relative-formula-mass-ht-only-6gtp8d https://www.bbc.co.uk/bitesize/guides/z3kg2nb/revision/1 https://teachers.thenational.academy/lessons/reacting-masses-ht-only-69jk4d https://teachers.thenational.academy/lessons/balancing-equations-using-moles-ht-only-6gwkar	

	equation • calculate the masses of reactants and products from the balanced symbol equation and the mass of a given reactant or product.		
	From masses to balanced equations ● The balancing numbers in a symbol equation can be calculated from the masses of reactants and products by converting the masses in grams to amounts in moles and converting the numbers of moles to simple whole number ratios. ● Balance an equation given the masses of reactants and products. ● Change the subject of a mathematical equation to solve problems. ● In a chemical reaction involving two reactants, it is common to use an excess of one of the reactants to ensure that all of the other reactant is used. The reactant that is completely used up is called the limiting reactant because it limits the amount of products. ● Explain the effect of a limiting quantity of a reactant on the amount of products it is possible to obtain in terms of amounts in moles or masses in grams.	https://www.bbc.co.uk/bitesize/guides/z3kg2nb/revision/3 https://www.youtube.com/watch?v=xsma3KjKPx8	
	Yield of a chemical reaction ● Even though no atoms are gained or lost in a chemical reaction, it is not always possible to obtain the calculated amount of a product because: • the reaction may not go to competition because it is reversible • some of the product may be lost when it is separated from the reaction mixture • some of the reactants may react in ways different to the expected reaction. ● The amount of a product obtained is known as the yield. When compared with the maximum theoretical amount as a percentage, it is called the percentage yield. % yield = mass of product actually made maximum theoretical mass of product × 100	https://www.youtube.com/watch?v=9EV0Oq8g708 https://www.youtube.com/watch?v=hnawBsyZTc8	

	• Calculate the theoretical amount of a product from a given amount of reactant and the balanced equation for the reaction • calculate the percentage yield of a product from the actual yield of a reaction.		
	Atom economy ● The atom economy (atom utilisation) is a measure of the amount of starting materials that end up as useful products. It is important for sustainable development and for economic reasons to use reactions with high atom economy. ● Know that the percentage atom economy of a reaction is calculated using the balanced symbol equation for the reaction as follows: ● relative formula mass of desired product from equation / sum of relative formula masses of all reactants from equation × 100 ● Calculate the atom economy of a reaction to form a desired product from the balanced equation ● Explain why a particular reaction pathway is chosen to produce a specified product given appropriate data such as atom economy (if not calculated), yield, rate, equilibrium position, and usefulness of by-products.	https://www.youtube.com/watch?v=h1-Vj6eh-mM https://www.youtube.com/watch?v=MQXzW9BryAg	
	Expressing concentrations • Know that many chemical reactions take place in solutions. The concentration of a solution can be measured in mass per given volume of solution, for example, grams per dm^3 (g/dm^3). • Calculate the mass of solute in a given volume of solution of known concentration in terms of mass per given volume of solution. • Explain how the mass of a solute and the volume of a solution is related to the concentration of the solution.	https://www.youtube.com/watch?v=kJBbu7_vYC8	
	Titration • Know that the volumes of acid and alkali solutions that react with each other can be measured by titration using a suitable indicator. • Know how to describe how to carry out titrations using strong acids and strong alkalis only (sulfuric, hydrochloric, and nitric acids only) to find the reacting volumes accurately.	https://www.youtube.com/watch?v=saRBT5oZfh8 https://www.youtube.com/watch?v=vn3Rx3g1VPk	

	Titration calculations • Know that the concentration of a solution can be measured in mol/dm^3. The amount in moles of solute or the mass in grams of solute in a given volume of solution can be calculated from its concentration in mol/dm^3. • Know that if the volumes of two solutions that react completely are known and the concentration of one solution is known, the concentration of the other solution can be calculated. • Know how to explain how the concentration of a solution in mol/dm^3 is related to the mass of the solute and the volume of the solution. • Know how to calculate the chemical quantities in titrations involving concentrations in mol/dm^3 and in g/dm^3.	https://www.youtube.com/watch?v=x8DLLCNMKAs https://www.youtube.com/watch?v=tDxnuVXegLI	
	Volume of gases • Know that equal amounts in moles of gases occupy the same volume under the same conditions of temperature and pressure. • Know that the volume of one mole of any gas at room temperature and pressure (20 °C and 1 atmosphere pressure) is 24 dm^3. • The volume of gaseous reactants and products can be calculated from the balanced equation for the reaction. • Know how to calculate the volume of a gas at room temperature and pressure from its mass and relative formula mass. • Know how to calculate volumes of gaseous reactants and products from a balanced equation and a given volume of a gaseous reactant or product.	https://www.youtube.com/watch?v=tYE-1nywlFs&t=16s https://www.youtube.com/watch?v=3mZKFBISp1M https://www.youtube.com/watch?v=Qn5CgfokdWk&t=44s	
P6: Molecules and matter	Density • The density of a material is defined by the equation: density = mass ÷ volume density, ρ, in kilograms per metre cubed, kg/m^3 mass, *m*, in kilograms, kg	https://www.youtube.com/playlist?list=PLAd0MSIZBSsF3vV_uxzbcNHuDrQ6Hc-Ul	

	volume, *V*, in metres cubed, m^3 • Required practical: Use appropriate apparatus to make and record the measurements needed to determine the densities of regular and irregular solid objects and liquids. Volume should be determined from the dimensions of regularly shaped objects, and by a displacement technique for irregularly shaped objects. Dimensions to be measured using appropriate apparatus such as a ruler, micrometer, or Vernier callipers.		
	States of matter • Know how the particle model can be used to explain: • the different states of matter • differences in density. • Recognise/draw simple diagrams to model the difference between solids, liquids, and gases. • Explain the differences in density between the different states of matter in terms of the arrangement of atoms or molecules.	https://teachers.thenational.academy/lessons/particle-models-6tj34r	
	Changes of state • Describe how, when substances change state (melt, freeze, boil, evaporate, condense, or sublimate), mass is conserved. • Changes of state are physical changes which differ from chemical changes because the material recovers it original properties if the change is reversed. • Interpret heating and cooling graphs that include changes of state.	https://www.youtube.com/watch?v=hkBrw2fG75U	
	Internal energy • Energy is stored inside a system by the particles (atoms and molecules) that make up the system. This is called internal energy. • Internal energy is the total kinetic energy and potential energy of all	https://teachers.thenational.academy/lessons/internal-energy-70t6ad https://teachers.thenational.academy/lessons/heating-	

	the particles (atoms and molecules) that make up a system. • Heating changes the energy stored within the system by increasing the energy of the particles that make up the system. This either raises the temperature of the system or produces a change of state. • Know that if the temperature of the system increases, the increase in temperature depends on the mass of the substance heated, the type of material, and the energy input to the system. • The following equation applies: • change in thermal energy = mass × specific heat capacity × temperature change [$\Delta E = m c \Delta\theta$] change in thermal energy ΔE in joules, J mass m in kilograms, kg specific heat capacity c in joules per kilogram per degree Celsius, J/kg °C , • temperature change $\Delta\theta$ in degrees Celsius, °C. • Know that the specific heat capacity of a substance is the amount of energy required to raise the temperature of one kilogram of the substance by one degree Celsius.	and-cooling-substances-c4wp4c	
	Specific latent heat • Know that if a change of state happens: • The energy needed for a substance to change state is called latent heat. • When a change of state occurs, the energy supplied changes the energy stored (internal energy) but not the temperature. • The specific latent heat of a substance is the amount of energy required to change the state of one kilogram of the substance with no change in temperature. energy for a change of state = mass × specific latent heat [$E = m L$] energy, E, in joules, J mass, m, in kilograms, kg	https://teachers.thenational.academy/lessons/latent-heat-chjk2r https://teachers.thenational.academy/lessons/multi-step-energy-calculations-crv36r	

	specific latent heat, *L,* in joules per kilogram, J/kg • Specific latent heat of fusion – change of state from solid to liquid • Specific latent heat of vaporisation – change of state from liquid to vapour • Pupils should be able to distinguish between specific heat capacity and specific latent heat.		
	Gas pressure and temperature • The molecules of a gas are in constant random motion. The temperature of the gas is related to the average kinetic energy of the molecules. Changing the temperature of a gas, held at constant volume, changes the pressure exerted by the gas. • Pupils should be able to: • explain how the motion of the molecules in a gas is related to both its temperature and its pressure • explain qualitatively the relation between the temperature of a gas and its pressure at constant volume.	https://www.bbc.co.uk/bitesize/guides/z2xcfcw/revision/1 https://www.youtube.com/watch?v=hKO3DpgiISk https://teachers.thenational.academy/lessons/gas-pressure-69hp6r	
	Gas pressure and volume ● A gas can be compressed or expanded by pressure changes. The pressure produces a net force at right angles to the wall of the gas container (or any surface). ● Pupils should be able to use the particle model to explain how increasing the volume in which a gas is contained, at constant temperature, can lead to a decrease in pressure. ● For a fixed mass of gas held at a constant temperature: ● pressure × volume = constant ● [$p\ V$ = constant] ● pressure p in Pascal, Pa ● volume V in metres cubed, m^3 ● Pupils should be able to calculate the change in the pressure of a gas or the volume of a gas (a fixed mass held at constant temperature) when either the pressure or volume is increased or decreased.	https://www.youtube.com/watch?v=RuoZgmNiMEo https://www.youtube.com/watch?v=tYE-1nywlFs https://www.youtube.com/watch?v=9PwzPDJ7GYc https://www.youtube.com/watch?v=Qn5CgfokdWk	

	● Work is the transfer of energy by a force. Doing work on a gas increases the internal energy of the gas and can cause an increase in the temperature of the gas. ● Explain how, in a given situation, for example a bicycle pump, doing work on an enclosed gas leads to an increase in the temperature of the gas.		
P7: Radioactivity	Atoms and radiation ● Know that atoms are very small, having a radius of about 1×10^{-10} metres. ● Know that the basic structure of an atom is a positively charged nucleus composed of both protons and neutrons surrounded by negatively charged electrons. The radius of a nucleus is less than ● 1/10 000 of the radius of an atom. Most of the mass of an atom is concentrated in the nucleus. ● Know that the electrons are arranged at different distances from the nucleus (different energy levels). The electron arrangements may change with the absorption of electromagnetic radiation (move further from the nucleus; a higher energy level) or by the emission of electromagnetic radiation (move closer to the nucleus; a lower energy level). ● Know that some atomic nuclei are unstable. The nucleus gives out radiation as it changes to become more stable. This is a random process called radioactive decay. ● Required knowledge of the properties of alpha particles, beta particles, and gamma rays is limited to their penetration through materials, their range in air, and ionising power.	https://www.bbc.co.uk/bitesize/guides/zxbnh39/revision/3 https://teachers.thenational.academy/lessons/radioactivity-6tgkjc https://teachers.thenational.academy/lessons/decay-equations-crup6d	
	The discovery of the nucleus ● New experimental evidence may lead to a scientific model being changed or replaced. ● Before the discovery of the electron, atoms were thought to be tiny spheres that could not be divided. ● The discovery of the electron led to the plum pudding model of the atom. The plum pudding model suggested that the atom is a ball of positive charge with negative electrons embedded in it. ● The results from the alpha scattering experiment led to the conclusion that the mass of an atom was concentrated at the centre (nucleus)	https://www.youtube.com/watch?v=0ASldDQmIOQ https://www.youtube.com/watch?v=wzALbzTdnc8 https://www.youtube.com/watch?v=1EdTw4I6L0U	

	and that the nucleus was charged. This nuclear model replaced the plum pudding model. ● Niels Bohr adapted the nuclear model by suggesting that electrons orbit the nucleus at specific distances. The theoretical calculations of Bohr agreed with experimental observation. ● Later experiments led to the idea that the positive charge of any nucleus can be subdivided into a whole number of smaller particles, each particle having the same amount of positive charge. The name proton was given to these particles. ● The experimental work of James Chadwick provided the evidence to show the existence of neutrons within the nucleus. This was about 20 years after the nucleus became an accepted scientific idea. • Describe why the new evidence from the scattering experiment led to a change in the atomic model • Describe the difference between the plum pudding model of the atom and the nuclear model of the atom. ● Details of experimental work supporting the Bohr model are not required. Details of Chadwick's experimental work are not required.		
	Changes in the nucleus ● In an atom the number of electrons is equal to the number of protons in the nucleus. Atoms have no overall electrical charge. ● All atoms of a particular element have the same number of protons. The number of protons in an atom of an element is called its atomic number. ● The total number of protons and neutrons in an atom is called its mass number. ● Atoms of the same element can have different numbers of neutrons; these atoms are called isotopes of that element. ● Atoms turn into positive ions if they lose one or more outer electron(s). ● Relate differences between isotopes to differences in conventional representations of their identities, charges, and masses. ● Nuclear equations are used to represent radioactive decay. ● The emission of the different types of nuclear radiation may cause a	https://www.youtube.com/watch?v=xpSBhUpBXic https://www.youtube.com/watch?v=VeXpMijpazE	

	change in the mass and/or the charge of the nucleus. So alpha decay causes both the mass and charge of the nucleus to decrease. So beta decay does not cause the mass of the nucleus to change but does cause the charge of the nucleus to increase. ● Use the names and symbols of common nuclei and particles to write balanced equations that show single alpha (α) and beta (β) decay. This is limited to balancing the atomic numbers and mass numbers. ● The emission of a gamma ray does not cause the mass or the charge of the nucleus to change.		
	More about alpha, beta, and gamma radiation ● The nuclear radiation emitted may be: • an alpha particle (α) – this consists of two neutrons and two protons, it is the same as a helium nucleus • a beta particle (β) – a high speed electron ejected from the nucleus as a neutron turns into a proton • a gamma ray (γ) – electromagnetic radiation from the nucleus • a neutron (n). ● Required knowledge of the properties of alpha particles, beta particles, and gamma rays is limited to their penetration through materials, their range in air, and ionising power. ● Apply their knowledge to the uses of radiation and evaluate the best sources of radiation to use in a given situation. ● Radioactive contamination is the unwanted presence of materials containing radioactive atoms on other materials. The hazard from contamination is due to the decay of the contaminating atoms. The type of radiation emitted affects the level of hazard. ● Irradiation is the process of exposing an object to nuclear radiation. The irradiated object does not become radioactive. ● Compare the hazards associated with contamination and irradiation. ● Suitable precautions must be taken to protect against any hazard that the radioactive source used in the process of irradiation may present. ● Understand that it is important for the findings of studies into the effects of radiation on humans to be published and shared with other scientists so that the findings can be checked by peer review.	https://www.youtube.com/watch?v=nW0S1C6wVrg https://www.youtube.com/watch?v=VeXpMijpazE&t=41s	
	Activity and half-life ● Activity is the rate at which a source of unstable nuclei decays.	https://teachers.thenational.academy/lessons/activity-and-half-life-ht-c9jk6d	

	● Activity is measured in becquerel (Bq). ● Count-rate is the number of decays recorded each second by a detector (e.g., Geiger–Muller tube). ● Know that radioactive decay is random. ● The half-life of a radioactive isotope is the time it takes for the number of nuclei of the isotope in a sample to halve, or the time it takes for the count rate (or activity) from a sample containing the isotope to fall to half its initial level. ● Pupils should be able to explain the concept of half-life and how it is related to the random nature of radioactive decay. ● Know how to determine the half-life of a radioactive isotope from given information. ● Know how to calculate the net decline, expressed as a ratio, in a radioactive emission after a given number of half-lives.	https://www.bbc.co.uk/bitesize/guides/zxbnh39/revision/3 https://teachers.thenational.academy/lessons/uses-and-hazards-of-radiation-combined-science-only-74uk6d	
	Nuclear radiation in medicine • Pupils should be able to explain why the hazards associated with radioactive material differ according to the half-life involved. • Know how nuclear radiations are used in medicine for the: • exploration of internal organs • control or destruction of unwanted tissue. • Know how to: • describe and evaluate the uses of nuclear radiations for exploration of internal organs, and for control or destruction of unwanted tissue • evaluate the perceived risks of using nuclear radiations in relation to given data and consequences.	https://www.youtube.com/watch?v=YejvYYRjSUk https://www.youtube.com/watch?v=gDrR_dVmqZk	
	Nuclear fission ● Radioactive isotopes have a very wide range of half-life values. ● Explain why the hazards associated with radioactive material differ	https://www.youtube.com/watch?v=onkW8BF5I3Q	

	according to the half-life involved. ● Nuclear fission is the splitting of a large and unstable nucleus (e.g., uranium or plutonium). Spontaneous fission is rare. Usually, for fission to occur the unstable nucleus must first absorb a neutron. ● The nucleus undergoing fission splits into two smaller nuclei, roughly equal in size, and emits two or three neutrons plus gamma rays. Energy is released by the fission reaction. ● All of the fission products have kinetic energy. ● The neutrons may go on to start a chain reaction. The chain reaction is controlled in a nuclear reactor to control the energy released. The explosion caused by a nuclear weapon is caused by an uncontrolled chain reaction. ● Draw/interpret diagrams representing nuclear fission and how a chain reaction may occur.	https://www.youtube.com/watch?v=ZKHpix5dgAU https://www.bbc.co.uk/bitesize/guides/zx86y4j/revision/3	
	Nuclear fusion ● Know that radioactive contamination is the unwanted presence of materials containing radioactive atoms on other materials. ● Know that the hazard from contamination is due to the decay of the contaminating atoms. The type of radiation emitted affects the level of hazard.	https://www.youtube.com/watch?v=g_BUbEIyaz8 https://www.youtube.com/watch?v=onkW8BF5I3Q&t=12s https://www.bbc.co.uk/bitesize/guides/zx86y4j/revision/3	
	Nuclear issues ● Know that radioactive contamination is the unwanted presence of materials containing radioactive atoms on other materials. The hazard from contamination is due to the decay of the contaminating atoms. The type of radiation emitted affects the level of hazard. ● Irradiation is the process of exposing an object to nuclear radiation. The irradiated object does not become radioactive. ● Know how to compare the hazards associated with contamination and irradiation. ● Suitable precautions must be taken to protect against any hazard that	https://www.youtube.com/watch?v=ar3-Ps04AJI https://www.youtube.com/watch?v=pm6jyNCL8rA	

	the radioactive source used in the process of irradiation may present. • Understand that it is important for the findings of studies into the effects of radiation on humans to be published and shared with other scientists so that the findings can be checked by peer review.		
C5: Chemical changes	The reactivity series • Metals react with oxygen to produce metal oxides. The reactions are oxidation reactions because metals gain oxygen. • Know how to explain reduction and oxidation in terms of loss or gain of oxygen. • Know that when metals react with other substances the metal atoms form positive ions. The reactivity of a metal is related to its tendency to form positive ions. Metals can be arranged in order of their reactivity in a reactivity series. The metals potassium, sodium, lithium, calcium, magnesium, zinc, iron, and copper can be put in order of their reactivity from their reactions with water and dilute acids. • Recall and describe the reactions, if any, of potassium, sodium, lithium, calcium, magnesium, zinc, iron, and copper with water or dilute acids and where appropriate, to place these metals in order of reactivity. • Deduce an order of reactivity of metals based on experimental results.	https://www.youtube.com/playlist?list=PLAd0MSIZBSsF3vV_uxzbcNHuDrQ6Hc-Ul	
	Displacement reactions • Know that the non-metals hydrogen and carbon are often included in the reactivity series. • Know that a more reactive metal can displace a less reactive metal from a compound. • Explain how the reactivity of metals with water or dilute acids is related to the tendency of the metal to form its positive ion. • Know that Oxidation is the loss of electrons and reduction is the gain of electrons. • Write ionic equations for displacement reactions. • Write half-equations for displacement reactions.	https://teachers.thenational.academy/lessons/displacement-reactions-of-metals-c5hk6r https://www.bbc.co.uk/bitesize/guides/zy7dgdm/revision/2	

	Extracting metals • Know that unreactive metals such as gold are found • in the Earth as the metal itself but most metals are found as compounds that require chemical reactions to extract the metal. Metals less reactive than carbon can be extracted from their oxides by reduction with carbon. Reduction involves the loss of oxygen. • Interpret or evaluate specific metal extraction processes when given appropriate information. • Identify the substances which are oxidised or reduced in terms of gain or loss of oxygen. • Know that oxidation is the loss of electrons and reduction is the gain of electrons. • Write ionic equations for displacement reactions • Identify in a given reaction, symbol equation, or half equation which species are oxidised and which are reduced.	https://www.bbc.co.uk/bitesize/guides/zsm7v9q/revision/3	
	Salts from metals • Know that acids react with some metals to produce salts and hydrogen. • Explain in terms of gain or loss of electrons, that these are redox reactions. • Know that soluble salts can be made from acids by reacting them with solid insoluble substances such as metals. The solid is added to the acid until no more reacts and the excess solid is filtered off to produce a solution of the salt. • Salt solutions can be crystallised to produce solid salts. Pupils should be able to describe how to make pure, dry samples of named soluble salts from information provided.	https://www.youtube.com/watch?v=ofw6oHSYGFI https://teachers.thenational.academy/lessons/making-salts-crw68c	
	Salts from insoluble bases • Acids are neutralised by bases (e.g.insoluble metal hydroxides and	https://www.youtube.com/watch?v=gIOMlwBoe_4&list=PLAd0MSIZBSsEygAZyDRkK0PgQZ6uiC98F&index=1	

	metal oxides) to produce salts and water. • The particular salt produced in any reaction between an acid and a base depends on: • the acid used (hydrochloric acid produces chlorides, nitric acid produces nitrates, sulfuric acid produces sulfates) the positive ions in the base. • Pupils should be able to: • predict products from given reactants • use the formulae of common ions to deduce the formulae of salts.	https://teachers.thenational.academy/lessons/making-salts-crw68c	
	Making more salts • Acids are neutralised by alkalis (e.g., • soluble metal hydroxides) to produce salts and water, and by metal carbonates to produce salts, water, and carbon dioxide. • The particular salt produced in any reaction between an acid and a base or alkali depends on: o the acid used (hydrochloric acid produces chlorides, nitric acid produces nitrates, sulfuric acid produces sulfates) o the positive ions in the alkali or carbonate. • Predict products from given reactants • Use the formulae of common ions to deduce the formulae of salts. • Soluble salts can be made from acids by reacting them with solid insoluble substances, such as metal oxides, hydroxides, or carbonates, The solid is added to the acid until no more reacts and the excess solid is filtered off to produce a solution of the salt. • Salt solutions can be crystallised to produce solid salts. Pupils should be able to describe how to make pure, dry samples of named soluble salts from information provided. • Required practical: preparation of a pure, dry sample of a soluble	https://www.youtube.com/playlist?list=PLAd0MSIZBSsF3vV_uxzbcNHuDrQ6Hc-Ul https://teachers.thenational.academy/lessons/making-salts-crw68c	

	salt from an insoluble substance and a dilute acid.		
	Neutralisation and the pH scale • Acids produce hydrogen ions, H^+, in aqueous solutions. Aqueous solutions of alkalis contain hydroxide ions, OH^-. The pH scale, from 0 to 14, is a measure of the acidity or alkalinity of a solution, and can be measured using universal indicator or a pH probe. • A solution with pH 7 is neutral. Aqueous solutions of acids have pH values of less than 7 and aqueous solutions of alkalis have pH values greater than 7. • Describe the use of universal indicator or a wide range indicator to measure the approximate pH of a solution • Use the pH scale to identify acidic or alkaline solutions.	https://www.youtube.com/watch?v=OS3wdtHGenE https://teachers.thenational.academy/lessons/acids-alkalis-and-the-ph-scale-chj38c	
	Strong and weak acids • A strong acid is completely ionised in aqueous solution. Examples of strong acids are hydrochloric acid, nitric acid, and sulfuric acid. • A weak acid is only partially ionised in aqueous solution. Examples of weak acids are ethanoic acid, citric acid, and carbonic acid. • For a given concentration of aqueous solutions, the stronger an acid, the lower the pH. • As the pH decreases by one unit, the hydrogen ion concentration of the solution increases by a factor of 10. • Pupils should be able to: • use and explain the terms dilute and concentrated (in terms of amount of substance), and weak and strong (in terms of the degree of ionisation) in relation to acids describe neutrality and relative acidity in terms of the effect on hydrogen ion concentration and the numerical value of pH (whole numbers only).	https://teachers.thenational.academy/lessons/strong-and-weak-acids-ctk34d	
C6: Electrolysis	Introduction to electrolysis	https://www.youtube.com/playlist?list=PLAd0MSIZBS	

	● When an ionic compound is melted or dissolved in water, the ions are free to move about within the liquid or solution. These liquids and solutions are able to conduct electricity and are called electrolytes. ● Passing an electric current through electrolytes causes the ions to move to the electrodes. ● Positively charged ions move to the negative electrode (the cathode), and negatively charged ions move to the positive electrode (the anode). Ions are discharged at the electrodes producing elements. This process is called electrolysis. ● Write half equations for the reactions occurring at the electrodes during electrolysis and may be required to complete and balance supplied half equations. ● When a simple ionic compound (e.g., lead bromide) is electrolysed in the molten state using inert electrodes, the metal (lead) is produced at the cathode and the non-metal (bromine) is produced at the anode. ● Pupils should be able to predict the products of the electrolysis of binary ionic compounds in the molten state.	sF3vV_uxzbcNHuDrQ6Hc-Ul https://teachers.thenational.academy/lessons/electrolysis-of-molten-compounds-cgw66t	
	Changes at the electrodes ● Write half equations for the reactions occurring at the electrodes during electrolysis, and may be required to complete and balance supplied half equations. ● The ions discharged when an aqueous solution is electrolysed using inert electrodes depend on the relative reactivity of the elements involved. ● At the negative electrode (cathode), hydrogen is produced if the metal is more reactive than hydrogen. ● At the positive electrode (anode), oxygen is produced unless the solution contains halide ions when the halogen is produced. This happens because in the aqueous solution water molecules break down producing hydrogen ions and hydroxide ions that are discharged. Pupils should be able to predict the products of the	https://www.bbc.co.uk/bitesize/guides/zcsyw6f/revision/1 https://www.youtube.com/watch?v=AhTRiL6xjBA	

	electrolysis of aqueous solutions containing a single ionic compound.		
	Extraction of aluminium • Write half equations for the reactions occurring at the electrodes during electrolysis and may be required to complete and balance supplied half equations. • Metals can be extracted from molten compounds using electrolysis. Electrolysis is used if the metal is too reactive to be extracted by reduction with carbon or if the metal reacts with carbon. Large amounts of energy are used in the extraction process to melt the compounds and to produce the electrical current. • Aluminium is manufactured by the electrolysis of a molten mixture of aluminium oxide and cryolite using carbon as the positive electrode (anode). • Explain why a mixture is used as the electrolyte • Explain why the positive electrode must be continually replaced. • During electrolysis, at the cathode (negative electrode), positively charged ions gain electrons and so the reactions are reductions. At the anode (positive electrode), negatively charged ions lose electrons and so the reactions are oxidations. • Reactions at electrodes can be represented by half equations, for example: $2H^+ + 2e^- \rightarrow H_2$ and $4OH^- \rightarrow O_2 + 2H_2O + 4e^-$ or $4OH^- - 4e^- \rightarrow O_2 + 2H_2O$	https://teachers.thenational.academy/lessons/extraction-of-aluminium-68w38r https://teachers.thenational.academy/lessons/electrolysis-half-equations-c8r6ar	
	Electrolysis of aqueous solutions • write half equations for the reactions occurring at the electrodes during electrolysis and may be required to complete and balance supplied half equations. • The ions discharged when an aqueous solution is electrolysed using inert electrodes depends on the reactivity of the elements involved.	https://teachers.thenational.academy/lessons/electrolysis-of-solutions-cmv3ge https://teachers.thenational.academy/lessons/electrolysis-half-equations-c8r6ar	

	• At the negative electrode (cathode), hydrogen is produced if the metal is more reactive than hydrogen. • At the positive electrode (anode), oxygen is produced unless the solution contains halide ions when the halogen is produced. • This happens because in the aqueous solution water molecules break down producing hydrogen ions and hydroxide ions that are discharged. • Pupils should be able to predict the products of the electrolysis of aqueous solutions containing a single ionic compound. • During electrolysis, at the cathode (negative electrode), positively charged ions gain electrons and so the reactions are reductions. At the anode (positive electrode), negatively charged ions lose electrons • and so the reactions are oxidations. • Reactions at electrodes can be represented by half equations, for example: $2H^+ + 2e^- \rightarrow H_2$ and $4OH^- \rightarrow O_2 + 2H_2O + 4e^-$ or $4OH^- - 4e^- \rightarrow O_2 + 2H_2O$ • Required practical: Investigate what happens when aqueous solutions are electrolysed using inert electrodes. This should be an investigation involving developing a hypothesis.		
C7: Energy changes	Exothermic and endothermic reactions ● Know that energy is conserved in chemical reactions. The amount of energy in the universe at the end of a chemical reaction is the same as before the reaction takes place. If a reaction transfers energy to the surroundings the product molecules must have less energy than the reactants, by the amount transferred. ● An exothermic reaction is one that transfers energy to the surroundings so the temperature of the surroundings increases. ● Exothermic reactions include combustion, many oxidation reactions and neutralisation. ● An endothermic reaction is one that takes in energy from the surroundings so the temperature of the surroundings decreases. ● Endothermic reactions include thermal decompositions and the reaction of citric acid and sodium hydrogen carbonate.	https://www.bbc.co.uk/bitesize/guides/zwfr2nb/video https://teachers.thenational.academy/lessons/exothermic-and-endothermic-reactions-cgw32t https://teachers.thenational.academy/lessons/required-practical-temperature-change-part-1-6tgp8c https://www.youtube.com/playlist?list=PLAd0MSIZBSsF3vV_uxzbcNHuDrQ6Hc-Ul	

	• Distinguish between exothermic and endothermic reactions on the basis of the temperature change of the surroundings. ● Limited to measurement of temperature change. Calculation of energy changes or Δ*H* is not required. ● Required practical: Investigate the variables that affect temperature changes in reacting solutions, for example, acid plus metals, acid plus carbonates, neutralisations.	https://www.bbc.co.uk/bitesize/guides/z2b2k2p/revision/1	
	Using energy transfers from reactions ● An exothermic reaction is one that transfers energy to the surroundings so the temperature of the surroundings increases. ● Everyday uses of exothermic reactions include self-heating cans and hand warmers. ● An endothermic reaction is one that takes in energy from the surroundings so the temperature of the surroundings decreases. ● Some sports injury packs are based on endothermic reactions. ● Evaluate uses and applications of exothermic and endothermic reactions given appropriate information.	https://www.revisechemistry.uk/GCSE/AQA/C5-EnergyChanges/endoexo.html https://www.youtube.com/watch?v=hVh-bpAv4_E https://www.youtube.com/watch?v=QfC9kifJyWI	
	Reaction profiles ● Chemical reactions can occur only when reacting particles collide with each other and with sufficient energy. The minimum amount of energy that particles must have to react is called the activation energy. ● Reaction profiles can be used to show the relative energies of reactants and products, the activation energy, and the overall energy change of a reaction. ● Draw simple reaction profiles (energy level diagrams) for exothermic and endothermic reactions showing the relative energies of reactants and products, the activation energy, and the overall energy change, with a curved line to show the energy as the reaction proceeds ● Use reaction profiles to identify reactions as exothermic or endothermic ● Explain that the activation energy is the energy needed for a reaction to occur ● Calculate energy changes.	https://teachers.thenational.academy/lessons/energy-level-diagrams-cgv68e https://www.youtube.com/watch?v=4HS6D0hTzdg https://www.youtube.com/watch?v=RNMEeDUxacs	

	(Higher) Know that during a chemical reaction: ● energy must be supplied to break bonds in the reactants ● energy is released when bonds in the products are formed.		
	Bond energy calculations (Higher) ● Know that during a chemical reaction: ● energy must be supplied to break bonds in the reactants ● energy is released when bonds in the products are formed. ● The energy needed to break bonds and the energy released when bonds are formed can be calculated from bond energies. ● The difference between the sum of the energy needed to break bonds in the reactants and the sum of the energy released when bonds in the products are formed is the overall energy change of the reaction. ● In an exothermic reaction, the energy released from forming new bonds is greater than the energy needed to break existing bonds. ● In an endothermic reaction, the energy needed to break existing bonds is greater than the energy released from forming new bonds. ● Pupils should be able to calculate the energy transferred in chemical reactions using bond energies supplied.	https://teachers.thenational.academy/lessons/calculating-bond-energies-68tker https://www.youtube.com/watch?v=it0HGXhxD-s https://www.youtube.com/watch?v=PdValXAVUOc	

Science – Combined

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
B3: Organisation and the digestive system	Tissues and organs ● Know that Cells are the basic building blocks of all living organisms. ● Know that a tissue is a group of cells with a similar structure and function. ● Know that organs are aggregations of tissues performing specific functions. ● Know that organs are organised into organ systems, which work together to form organisms.	https://www.youtube.com/watch?v=VO2QkpwAG9o	
	The human digestive system ● Identify some of the organs of the digestive system. ● State the function of some of the organs of the digestive system. ● State simply what happens to food during digestion. ● Name all of the organs of the digestive system. ● Describe the functions of the organs of the digestive system. ● Summarise the process of digestion. ● Link the process of digestion to other processes in the body in order to explain its function. ● Explain in detail how the small intestine is adapted to its function. ● Explain in detail what happens to food during digestion.	https://www.youtube.com/watch?v=4ui4oSHHnzA https://www.youtube.com/watch?v=vMI46qGQMDw	
	The chemistry of food ● Know that carbohydrase break down carbohydrates to simple sugars. Proteases break down proteins to amino acids. ● Lipases break down lipids (fats) to glycerol and fatty acids. The products of digestion are used to build new carbohydrates, lipids, and proteins. Some glucose is used in respiration. ● Required practical: Use qualitative reagents to test for a range of carbohydrates, lipids, and proteins. To include: Benedict's test for sugars; iodine test for starch; and Biuret reagent for protein.	https://teachers.thenational.academy/lessons/food-tests-61h3cd https://www.youtube.com/watch?v=5VW5-VXlWic https://www.youtube.com/watch?v=VLK2wANjQm0	
	Catalysts and enzymes	https://teachers.thenational.academy/lesson	

	● Relate knowledge of enzymes to metabolism. ● Carry out rate calculations for chemical reactions. ● Enzymes catalyse specific reactions in living organisms due to the shape of their active site. ● Use the 'lock and key theory' as a simplified model to explain enzyme action. ● Explain the importance of sugars, amino acids, fatty acids, and glycerol in the synthesis and breakdown of carbohydrates, proteins, and lipids. ● Know that Metabolism is the sum of all the reactions in a cell or the body. ● The energy transferred by respiration in cells is used by the organism for the continual enzyme-controlled processes of metabolism that synthesise new molecules.	s/digestive-enzymes-6dgkgr https://www.youtube.com/watch?v=VNX9UQ08fZ4	
	Factors affecting enzyme action ● Describe the nature of enzyme molecules and relate their activity to temperature and pH changes	https://teachers.thenational.academy/lessons/investigating-enzymes-60w64t	
	How the digestive system works ● Pupils should be able to recall the sites ● of production and the action of amylase, proteases, and lipases. ● Pupils should be able to understand simple word equations but no chemical symbol equations are required. ● Digestive enzymes convert food into small soluble molecules that can be absorbed into the bloodstream. ● Carbohydrase break down carbohydrates to simple sugars. ● Amylase is a carbohydrase which breaks down starch. ● Proteases break down proteins to amino acids. ● Lipases break down lipids (fats) to glycerol and fatty acids. ● Required practical: Investigate the effect of a factor on the rate of an enzyme-controlled reaction.	https://teachers.thenational.academy/lessons/digestion-cnk66c https://www.youtube.com/watch?v=6jz9WvfKDVc https://teachers.thenational.academy/lessons/absorption-74v38e https://teachers.thenational.academy/lessons/ph-and-enzymes-part-1-cru3jt https://teachers.thenational.academy/lesson	

		s/ph-and-enzymes-part-2-75h3gr https://www.youtube.com/watch?v=JyXXoevEWc8 https://www.youtube.com/watch?v=8Yqbu56ImXk&t=44s	
	Making digestion efficient ● Know that digestive enzymes convert food into small soluble substances that can be absorbed into the bloodstream. ● Explain that: Bile is made in the liver and stored in the gall bladder. It is alkaline to neutralise hydrochloric acid from the stomach. It also emulsifies fat to form small droplets which increases the surface area. The alkaline conditions and large surface area increase the rate of fat break down by lipase.	https://www.youtube.com/watch?v=VLK2wANjQm0	
B4: Organising animals and plants	The blood ● Know that blood is a tissue consisting of plasma, in which the red blood cells, white blood cells, and platelets are suspended. ● Know the functions of each of these blood components. ● Recognise different types of blood cells in a photograph or diagram and explain how they are adapted to their functions.	https://www.youtube.com/watch?v=nc_kbfjhiUo https://www.youtube.com/watch?v=81w0BXg7QJA	
	The blood vessels ● Know that the heart is an organ that pumps blood around the body in a double circulatory system. ● Know that the body contains three different types of blood vessel: • arteries • veins • capillaries. ● Explain how the structure of these vessels relates to their functions.	https://www.youtube.com/watch?v=AlSQEs694qY	

	● Use simple compound measures such as rate and carry out rate calculations for blood flow		
	The heart ● Know the structure and functioning of the human heart. ● Know that the heart is an organ that pumps blood around the body in a double circulatory system. The right ventricle pumps blood to the lungs where gas exchange takes place. The left ventricle pumps blood around the rest of the body. ● Knowledge of the blood vessels associated with the heart is limited to the aorta, vena cava, pulmonary artery, pulmonary vein, and coronary arteries. Knowledge of the names of the heart valves is not required. ● In coronary heart disease layers of fatty material build up inside the coronary arteries, narrowing them. This reduces the flow of blood through the coronary arteries, resulting in a lack of oxygen for the heart muscle. Stents are used to keep the coronary arteries open. Statins are widely used to reduce blood cholesterol levels which slows down the rate of fatty material deposit	https://www.youtube.com/watch?v=bpYaKM2hVFY https://teachers.thenational.academy/lessons/heart-rate-6cr32r	
	Helping the heart ● The natural resting heart rate is controlled by a group of cells located in the right atrium that act as a pacemaker. Artificial pacemakers are electrical devices used to correct irregularities in the heart rate. ● Evaluate the advantages and disadvantages of treating cardiovascular diseases by drugs, mechanical devices, or transplant. In some people heart valves may become faulty, preventing the valve from opening fully, or the heart valve might develop a leak. ● Understand the consequences of faulty valves. Faulty heart valves can be replaced using biological or mechanical valves. In the case of heart failure, a donor heart, or heart and lungs can be transplanted. Artificial hearts are occasionally used to keep patients alive whilst waiting for a heart transplant, or to allow the heart to rest as an aid to recovery	https://teachers.thenational.academy/lessons/heart-disease-61k68d https://teachers.thenational.academy/lessons/heart-rate-6cr32r	
	Breathing and gas exchange ● Know the structure and functioning of the human lungs, including how	https://teachers.thenational.academy/lessons/the-lungs-ccu3ge	

	lungs are adapted for gaseous exchange.		
	Tissues and organs in plants ● Explain how the structures of plant tissues are related to their functions. ● Plant tissues include: • epidermal tissues, which cover the plant • palisade mesophyll • spongy mesophyll • xylem and phloem • meristem tissue found at the growing tips of shoots and roots. ● Know that the leaf is a plant organ. ● Knowledge limited to epidermis, palisade and spongy mesophyll, xylem and phloem, and guard cells surrounding stomata. ● Know that the roots, stem, and leaves form a plant organ system for transport of substances around the plant.	https://www.youtube.com/watch?v=2BR1zdMBhY4 https://www.youtube.com/watch?v=svCLQQwo5PU https://teachers.thenational.academy/lessons/plant-tissue-cnh32t	
	Transport systems in plants ● Explain how the structure of xylem and phloem are adapted to their function. Xylem tissue transports water and mineral ions from the roots to the stems and leaves. It is composed of hollow tubes strengthened by lignin adapted for the transport of water in the transpiration stream. ● Know that the Phloem tissue transports dissolved sugars from the leaves to the rest of the plant for immediate use or storage. The movement of food through phloem is called translocation. ● Know that the Phloem is composed of tubes of elongated cells. Cell sap can move from one phloem cell to the next through pores in the end walls. Detailed structure of phloem tissue or the mechanism of transport is not required.	https://teachers.thenational.academy/lessons/transport-in-plants-6rr38c	
	Evaporation and transpiration ● Know that the Xylem tissue transports water and mineral ions from the roots to the stems and leaves. It is composed of hollow tubes strengthened by lignin adapted for the transport of water in the transpiration stream. ● Explain the role of stomata and guard cells is in controlling gas exchange and water loss.	https://www.youtube.com/watch?v=9yTDokLRZs0 https://www.youtube.com/watch?v=Kf_efUdoADI	
	Factors affecting transpiration	https://teachers.thenational.academy/lesson	

	● Explain the effect of changing temperature, humidity, air movement, and light intensity on the rate of transpiration. ● Understand and use simple compound measures such as the rate of transpiration. ● Know how to: • translate information between graphical and numerical form • plot and draw appropriate graphs, selecting appropriate scales for axes • extract and interpret information from graphs, charts and tables.	s/investigating-transpiration-6tjk0r	
C4: Chemical calculations	Relative masses and moles ● The relative formula mass *M*r of a compound is the sum of the relative atomic masses of the atoms in the numbers shown in the formula. ● Chemical amounts are measured in moles. The symbol for the unit mole is mol. ● The mass of one mole of a substance in grams is numerically equal to its relative formula mass. ● One mole of a substance contains the same number of the stated particles, atoms, molecules, or ions as one mole of any other substance. ● The number of atoms, molecules, or ions in a mole of a given substance is the Avogadro constant. The value of the Avogadro constant is 6.02×10^{23} per mole. ● Pupils should understand that the measurement of amounts in moles can apply to atoms, molecules, ions, electrons, formulae, and equations, for example that in one mole of carbon, C, the number of atoms is the same as the number of molecules in one mole of carbon dioxide, CO_2. ● Pupils should be able to use the relative formula mass of a substance to calculate the number of moles in a given mass of that substance and vice versa.	https://teachers.thenational.academy/lessons/moles-and-avogadros-constant-ht-only-chj3jt https://www.youtube.com/watch?v=wPGVQu3UXpw	
	Equations and calculations ● The masses of reactants and products can be calculated from balanced symbol equations. ● Know how chemical equations can be interpreted in terms of moles.	https://teachers.thenational.academy/lessons/relative-formula-mass-ht-only-6gtp8d https://www.bbc.co.uk/bitesize/guides/z3kg2nb/revision/1	

	For example: $Mg + 2HCl \rightarrow MgCl_2 + H_2$: shows that one mole of magnesium reacts with two moles of hydrochloric acid to produce one mole of magnesium chloride and one mole of hydrogen gas. Pupils should be able to: • calculate the masses of substances shown in a balanced symbol equation • calculate the masses of reactants and products from the balanced symbol equation and the mass of a given reactant or product.	https://teachers.thenational.academy/lessons/reacting-masses-ht-only-69jk4d https://teachers.thenational.academy/lessons/balancing-equations-using-moles-ht-only-6gwkar	
	From masses to balanced equations ● The balancing numbers in a symbol equation can be calculated from the masses of reactants and products by converting the masses in grams to amounts in moles and converting the numbers of moles to simple whole number ratios. ● Balance an equation given the masses of reactants and products. ● Change the subject of a mathematical equation to solve problems. ● In a chemical reaction involving two reactants, it is common to use an excess of one of the reactants to ensure that all of the other reactant is used. The reactant that is completely used up is called the limiting reactant because it limits the amount of products. ● Explain the effect of a limiting quantity of a reactant on the amount of products it is possible to obtain in terms of amounts in moles or masses in grams.	https://www.bbc.co.uk/bitesize/guides/z3kg2nb/revision/3 https://www.youtube.com/watch?v=xsma3KjKPx8	
	Yield of a chemical reaction ● Even though no atoms are gained or lost in a chemical reaction, it is not always possible to obtain the calculated amount of a product because: • the reaction may not go to competition because it is reversible • some of the product may be lost when it is separated from the reaction mixture • some of the reactants may react in ways different to the expected reaction.	https://www.youtube.com/watch?v=9EV0Oq8g708 https://www.youtube.com/watch?v=hnawBsyZTc8	

	● The amount of a product obtained is known as the yield. When compared with the maximum theoretical amount as a percentage, it is called the percentage yield. ● % yield = mass of product actually made maximum theoretical mass of product × 100 ● Calculate the theoretical amount of a product from a given amount of reactant and the balanced equation for the reaction ● calculate the percentage yield of a product from the actual yield of a reaction.		
	Atom economy ● The atom economy (atom utilisation) is a measure of the amount of starting materials that end up as useful products. It is important for sustainable development and for economic reasons to use reactions with high atom economy. ● Know that the percentage atom economy of a reaction is calculated using the balanced symbol equation for the reaction as follows: ● relative formula mass of desired product from equation / sum of relative formula masses of all reactants from equation × 100 • Calculate the atom economy of a reaction to form a desired product from the balanced equation ● Explain why a particular reaction pathway is chosen to produce a specified product given appropriate data such as atom economy (if not calculated), yield, rate, equilibrium position, and usefulness of by-products.	https://www.youtube.com/watch?v=h1-Vj6eh-mM https://www.youtube.com/watch?v=MQXzW9BryAg	
	Expressing concentrations ● Know that many chemical reactions take place in solutions. The concentration of a solution can be measured in mass per given volume of solution, for example, grams per dm^3 (g/dm^3). ● Calculate the mass of solute in a given volume of solution of known concentration in terms of mass per given volume of solution. ● Explain how the mass of a solute and the volume of a solution is related	https://www.youtube.com/watch?v=kJBbu7_vYC8	

	to the concentration of the solution.		
P6: Molecules and matter	Density ● The density of a material is defined by the equation: density = mass ÷ volume density, ρ, in kilograms per metre cubed, kg/m^3 mass, *m*, in kilograms, kg volume, *V*, in metres cubed, m^3 ● Required practical: Use appropriate apparatus to make and record the measurements needed to determine the densities of regular and irregular solid objects and liquids. Volume should be determined from the dimensions of regularly shaped objects, and by a displacement technique for irregularly shaped objects. Dimensions to be measured using appropriate apparatus such as a ruler, micrometer, or Vernier callipers.	https://www.youtube.com/playlist?list=PLAd0MSIZBSsF3vV_uxzbcNHuDrQ6Hc-Ul	
	States of matter ● Know how the particle model can be used to explain: • the different states of matter • differences in density. ● Recognise/draw simple diagrams to model the difference between solids, liquids, and gases. • Explain the differences in density between the different states of matter in terms of the arrangement of atoms or molecules.	https://teachers.thenational.academy/lessons/particle-models-6tj34r	
	Changes of state ● Describe how, when substances change state (melt, freeze, boil, evaporate, condense, or sublimate), mass is conserved. ● Changes of state are physical changes which differ from chemical changes because the material recovers it original properties if the	https://www.youtube.com/watch?v=hkBrw2fG75U	

	change is reversed ● Interpret heating and cooling graphs that include changes of state.		
	Internal energy ● Energy is stored inside a system by the particles (atoms and molecules) that make up the system. This is called internal energy. ● Internal energy is the total kinetic energy and potential energy of all the particles (atoms and molecules) that make up a system. ● Heating changes the energy stored within the system by increasing the energy of the particles that make up the system. This either raises the temperature of the system or produces a change of state. ● Know that if the temperature of the system increases, the increase in temperature depends on the mass of the substance heated, the type of material, and the energy input to the system. ● The following equation applies: change in thermal energy = mass × specific heat capacity × temperature change [$\Delta E = m\,c\,\Delta\theta$] change in thermal energy ΔE in joules, J mass m in kilograms, kg specific heat capacity c in joules per kilogram per degree Celsius, J/kg °C , temperature change $\Delta\theta$ in degrees Celsius, °C. ● Know that the specific heat capacity of a substance is the amount of energy required to raise the temperature of one kilogram of the substance by one degree Celsius.	https://teachers.thenational.academy/lessons/internal-energy-70t6ad https://teachers.thenational.academy/lessons/heating-and-cooling-substances-c4wp4c	
	Specific latent heat ● Know that if a change of state happens: ● The energy needed for a substance to change state is called latent heat. ● When a change of state occurs, the energy supplied changes the energy stored (internal energy) but not the temperature. ● The specific latent heat of a substance is the amount of energy	https://teachers.thenational.academy/lessons/latent-heat-chjk2r https://teachers.thenational.academy/lessons/multi-step-energy-calculations-crv36r	

	required to change the state of one kilogram of the substance with no change in temperature. ● energy for a change of state = mass × specific latent heat [$E = m L$] ● energy, *E,* in joules, J ● mass, *m,* in kilograms, kg ● specific latent heat, *L,* in joules per kilogram, J/kg ● Specific latent heat of fusion – change of state from solid to liquid ● Specific latent heat of vaporisation – change of state from liquid to vapour ● Pupils should be able to distinguish between specific heat capacity and specific latent heat.		
	Gas pressure and temperature ● The molecules of a gas are in constant random motion. The temperature of the gas is related to the average kinetic energy of the molecules. Changing the temperature of a gas, held at constant volume, changes the pressure exerted by the gas. ● Pupils should be able to: • explain how the motion of the molecules in a gas is related to both its temperature and its pressure • explain qualitatively the relation between the temperature of a gas and its pressure at constant volume.	https://www.bbc.co.uk/bitesize/guides/z2xcfcw/revision/1 https://www.youtube.com/watch?v=hKO3DpgiISk https://teachers.thenational.academy/lessons/gas-pressure-69hp6r	
P7: Radioactivity	Atoms and radiation ● Know that atoms are very small, having a radius of about 1×10^{-10} metres. ● Know that the basic structure of an atom is a positively charged nucleus composed of both protons and neutrons surrounded by negatively charged electrons. The radius of a nucleus is less than ● 1/10 000 of the radius of an atom. Most of the mass of an atom is concentrated in the nucleus.	https://www.bbc.co.uk/bitesize/guides/zxbnh39/revision/3 https://teachers.thenational.academy/lessons/radioactivity-6tgkjc https://teachers.thenational.academy/lessons/decay-equations-crup6d	

	● Know that the electrons are arranged at different distances from the nucleus (different energy levels). The electron arrangements may change with the absorption of electromagnetic radiation (move further from the nucleus; a higher energy level) or by the emission of electromagnetic radiation (move closer to the nucleus; a lower energy level). ● Know that some atomic nuclei are unstable. The nucleus gives out radiation as it changes to become more stable. This is a random process called radioactive decay. ● Required knowledge of the properties of alpha particles, beta particles, and gamma rays is limited to their penetration through materials, their range in air, and ionising power.		
	The discovery of the nucleus ● New experimental evidence may lead to a scientific model being changed or replaced. ● Before the discovery of the electron, atoms were thought to be tiny spheres that could not be divided. ● The discovery of the electron led to the plum pudding model of the atom. The plum pudding model suggested that the atom is a ball of positive charge with negative electrons embedded in it. ● The results from the alpha scattering experiment led to the conclusion that the mass of an atom was concentrated at the centre (nucleus) and that the nucleus was charged. This nuclear model replaced the plum pudding model. ● Niels Bohr adapted the nuclear model by suggesting that electrons orbit the nucleus at specific distances. The theoretical calculations of Bohr agreed with experimental observation. ● Later experiments led to the idea that the positive charge of any nucleus can be subdivided into a whole number of smaller particles, each particle having the same amount of positive charge. The name proton was given to these particles. ● The experimental work of James Chadwick provided the evidence to show the existence of neutrons within the nucleus. This was about 20	https://www.youtube.com/watch?v=0ASldDQmIOQ https://www.youtube.com/watch?v=wzALbzTdnc8 https://www.youtube.com/watch?v=1EdTw4I6L0U	

	years after the nucleus became an accepted scientific idea. • Describe why the new evidence from the scattering experiment led to a change in the atomic model • Describe the difference between the plum pudding model of the atom and the nuclear model of the atom. ● Details of experimental work supporting the Bohr model are not required. Details of Chadwick's experimental work are not required.		
	Changes in the nucleus ● In an atom the number of electrons is equal to the number of protons in the nucleus. Atoms have no overall electrical charge. ● All atoms of a particular element have the same number of protons. The number of protons in an atom of an element is called its atomic number. ● The total number of protons and neutrons in an atom is called its mass number. ● Atoms of the same element can have different numbers of neutrons; these atoms are called isotopes of that element. ● Atoms turn into positive ions if they lose one or more outer electron(s). ● Relate differences between isotopes to differences in conventional representations of their identities, charges, and masses. ● Nuclear equations are used to represent radioactive decay. ● The emission of the different types of nuclear radiation may cause a change in the mass and/or the charge of the nucleus. So alpha decay causes both the mass and charge of the nucleus to decrease. So beta decay does not cause the mass of the nucleus to change but does cause the charge of the nucleus to increase. ● Use the names and symbols of common nuclei and particles to write balanced equations that show single alpha (α) and beta (β) decay. This is limited to balancing the atomic numbers and mass numbers. ● The emission of a gamma ray does not cause the mass or the charge of the nucleus to change.	https://www.youtube.com/watch?v=xpSBhUpBXic https://www.youtube.com/watch?v=VeXpMijpazE	

	More about alpha, beta, and gamma radiation The nuclear radiation emitted may be: • an alpha particle (α) – this consists of two neutrons and two protons, it is the same as a helium nucleus • a beta particle (β) – a high speed electron ejected from the nucleus as a neutron turns into a proton • a gamma ray (γ) – electromagnetic radiation from the nucleus • a neutron (n). ● Required knowledge of the properties of alpha particles, beta particles, and gamma rays is limited to their penetration through materials, their range in air, and ionising power. ● Apply their knowledge to the uses of radiation and evaluate the best sources of radiation to use in a given situation. ● Radioactive contamination is the unwanted presence of materials containing radioactive atoms on other materials. The hazard from contamination is due to the decay of the contaminating atoms. The type of radiation emitted affects the level of hazard. ● Irradiation is the process of exposing an object to nuclear radiation. The irradiated object does not become radioactive. ● Compare the hazards associated with contamination and irradiation. ● Suitable precautions must be taken to protect against any hazard that the radioactive source used in the process of irradiation may present. ● Understand that it is important for the findings of studies into the effects of radiation on humans to be published and shared with other scientists so that the findings can be checked by peer review.	https://www.youtube.com/watch?v=nW0S1C6wVrg https://www.youtube.com/watch?v=VeXpMijpazE&t=41s	
	Activity and half-life ● Activity is the rate at which a source of unstable nuclei decays. ● Activity is measured in becquerel (Bq). ● Count-rate is the number of decays recorded each second by a detector (e.g., Geiger–Muller tube). ● Know that radioactive decay is random. ● The half-life of a radioactive isotope is the time it takes for the number	https://teachers.thenational.academy/lessons/activity-and-half-life-ht-c9jk6d https://www.bbc.co.uk/bitesize/guides/zxbnh39/revision/3	

	of nuclei of the isotope in a sample to halve, or the time it takes for the count ● rate (or activity) from a sample containing the isotope to fall to half its initial level. ● Pupils should be able to explain the concept of half-life and how it is related to the random nature of radioactive decay. ● Know how to determine the half-life of a radioactive isotope from given information. ● Know how to calculate the net decline, expressed as a ratio, in a radioactive emission after a given number of half-lives.	https://teachers.thenational.academy/lessons/uses-and-hazards-of-radiation-combined-science-only-74uk6d	
C6: Electrolysis	Introduction to electrolysis ● When an ionic compound is melted or dissolved in water, the ions are free to move about within the liquid or solution. These liquids and solutions are able to conduct electricity and are called electrolytes. ● Passing an electric current through electrolytes causes the ions to move to the electrodes. ● Positively charged ions move to the negative electrode (the cathode), and negatively charged ions move to the positive electrode (the anode). Ions are discharged at the electrodes producing elements. This process is called electrolysis. ● Write half equations for the reactions occurring at the electrodes during electrolysis, and may be required to complete and balance supplied half equations. (Higher) ● When a simple ionic compound (e.g., lead bromide) is electrolysed in the molten state using inert electrodes, the metal (lead) is produced at the cathode and the non-metal (bromine) is produced at the anode. ● Pupils should be able to predict the products of the electrolysis of binary ionic compounds in the molten state.	https://www.youtube.com/playlist?list=PLAd0MSIZBSsF3vV_uxzbcNHuDrQ6Hc-Ul https://teachers.thenational.academy/lessons/electrolysis-of-molten-compounds-cgw66t	
	Changes at the electrodes ● Write half equations for the reactions occurring at the electrodes during electrolysis and may be required to complete and balance supplied half equations. (Higher)	https://www.bbc.co.uk/bitesize/guides/zcsyw6f/revision/1 https://www.youtube.com/watch?v=AhTRiL6	

	● The ions discharged when an aqueous solution is electrolysed using inert electrodes depend on the relative reactivity of the elements involved. ● At the negative electrode (cathode), hydrogen is produced if the metal is more reactive than hydrogen. ● At the positive electrode (anode), oxygen is produced unless the solution contains halide ions when the halogen is produced. This happens because in the aqueous solution water molecules break down producing hydrogen ions and hydroxide ions that are discharged. Pupils should be able to predict the products of the electrolysis of aqueous solutions containing a single ionic compound.	xjBA	
	Extraction of aluminium ● Write half equations for the reactions occurring at the electrodes during electrolysis and may be required to complete and balance supplied half equations. (Higher) ● Metals can be extracted from molten compounds using electrolysis. Electrolysis is used if the metal is too reactive to be extracted by reduction with carbon or if the metal reacts with carbon. Large amounts of energy are used in the extraction process to melt the compounds and to produce the electrical current. ● Aluminium is manufactured by the electrolysis of a molten mixture of aluminium oxide and cryolite using carbon as the positive electrode (anode). ● Explain why a mixture is used as the electrolyte ● Explain why the positive electrode must be continually replaced. ● During electrolysis, at the cathode (negative electrode), positively charged ions gain electrons and so the reactions are reductions. At the anode (positive electrode), negatively charged ions lose electrons and so the reactions are oxidations. ● Reactions at electrodes can be represented by half equations, for example: $2H^+ + 2e^- \rightarrow H_2$ and $4OH^- \rightarrow O_2 + 2H_2O + 4e^-$ or $4OH^- - 4e^- \rightarrow O_2 +$	https://teachers.thenational.academy/lessons/extraction-of-aluminium-68w38r https://teachers.thenational.academy/lessons/electrolysis-half-equations-c8r6ar	

	$2H_2O$		
	Electrolysis of aqueous solutions ● Write half equations for the reactions occurring at the electrodes during electrolysis, and may be required to complete and balance supplied half equations. (Higher) ● The ions discharged when an aqueous solution is electrolysed using inert electrodes depends on the reactivity of the elements involved. ● At the negative electrode (cathode), hydrogen is produced if the metal is more reactive than hydrogen ● At the positive electrode (anode), oxygen is produced unless the solution contains halide ions when the halogen is produced. ● This happens because in the aqueous solution water molecules break down producing hydrogen ions and hydroxide ions that are discharged. ● Pupils should be able to predict the products of the electrolysis of aqueous solutions containing a single ionic compound. ● During electrolysis, at the cathode (negative electrode), positively charged ions gain electrons and so the reactions are reductions. At the anode (positive electrode), negatively charged ions lose electrons and so the reactions are oxidations. ● Reactions at electrodes can be represented by half equations, for example: ● $2H^+ + 2e^- \rightarrow H_2$ and $4OH^- \rightarrow O_2 + 2H_2O + 4e^-$ or $4OH^- - 4e^- \rightarrow O_2 + 2H_2O$ ● Required practical: Investigate what happens when aqueous solutions are electrolysed using inert electrodes. This should be an investigation involving developing a hypothesis.	https://teachers.thenational.academy/lessons/electrolysis-of-solutions-cmv3ge https://teachers.thenational.academy/lessons/electrolysis-half-equations-c8r6ar	
C7: Energy changes	Exothermic and endothermic reactions ● Know that energy is conserved in chemical reactions. The amount of energy in the universe at the end of a chemical reaction is the same as	https://www.bbc.co.uk/bitesize/guides/zwfr2nb/video	

	before the reaction takes place. If a reaction transfers energy to the surroundings the product molecules must have less energy than the reactants, by the amount transferred. ● An exothermic reaction is one that transfers energy to the surroundings so the temperature of the surroundings increases. ● Exothermic reactions include combustion, many oxidation reactions and neutralisation. ● An endothermic reaction is one that takes in energy from the surroundings so the temperature of the surroundings decreases. ● Endothermic reactions include thermal decompositions and the reaction of citric acid and sodium hydrogen carbonate. • Distinguish between exothermic and endothermic reactions on the basis of the temperature change of the surroundings. ● Limited to measurement of temperature change. Calculation of energy changes or Δ*H* is not required. ● Required practical: Investigate the variables that affect temperature changes in reacting solutions, for example, acid plus metals, acid plus carbonates, neutralisations.	https://teachers.thenational.academy/lessons/exothermic-and-endothermic-reactions-cgw32t https://teachers.thenational.academy/lessons/required-practical-temperature-change-part-1-6tgp8c https://www.youtube.com/playlist?list=PLAd0MSIZBSsF3vV_uxzbcNHuDrQ6Hc-Ul https://www.bbc.co.uk/bitesize/guides/z2b2k2p/revision/1	
	Using energy transfers from reactions ● An exothermic reaction is one that transfers energy to the surroundings so the temperature of the surroundings increases. ● Everyday uses of exothermic reactions include self-heating cans and hand warmers. ● An endothermic reaction is one that takes in energy from the surroundings so the temperature of the surroundings decreases. ● Some sports injury packs are based on endothermic reactions. ● Evaluate uses and applications of exothermic and endothermic reactions given appropriate information.	https://www.revisechemistry.uk/GCSE/AQA/C5-EnergyChanges/endoexo.html https://www.youtube.com/watch?v=hVh-bpAv4_E https://www.youtube.com/watch?v=QfC9kifJyWI	
	Reaction profiles ● Chemical reactions can occur only when reacting particles collide with each other and with sufficient energy. The minimum amount of energy	https://teachers.thenational.academy/lessons/energy-level-diagrams-cgv68e https://www.youtube.com/watch?v=4HS6D0	

	that particles must have to react is called the activation energy. ● Reaction profiles can be used to show the relative energies of reactants and products, the activation energy, and the overall energy change of a reaction. ● Draw simple reaction profiles (energy level diagrams) for exothermic and endothermic reactions showing the relative energies of reactants and products, the activation energy, and the overall energy change, with a curved line to show the energy as the reaction proceeds ● Use reaction profiles to identify reactions as exothermic or endothermic ● Explain that the activation energy is the energy needed for a reaction to occur ● Calculate energy changes. (Higher) Know that during a chemical reaction: • energy must be supplied to break bonds in the reactants • energy is released when bonds in the products are formed.	hTzdg https://www.youtube.com/watch?v=RNMEeDUxacs	
	Bond energy calculations (Higher) Know that during a chemical reaction: • energy must be supplied to break bonds in the reactants • energy is released when bonds in the products are formed. ● The energy needed to break bonds and the energy released when bonds are formed can be calculated from bond energies ● The difference between the sum of the energy needed to break bonds in the reactants and the sum of the energy released when bonds in the products are formed is the overall energy change of the reaction. ● In an exothermic reaction, the energy released from forming new bonds is greater than the energy needed to break existing bonds. ● In an endothermic reaction, the energy needed to break existing bonds is greater than the energy released from forming new bonds. ● Pupils should be able to calculate the energy transferred in chemical reactions using bond energies supplied.	https://teachers.thenational.academy/lessons/calculating-bond-energies-68tker https://www.youtube.com/watch?v=it0HGXhxD-s https://www.youtube.com/watch?v=PdValXAVUOc	
B9: Respiration	Aerobic respiration	https://www.bbc.co.uk/bitesize/guides/zp4mk2p/revision/1	

	● Know the chemistry of aerobic respiration ● Know why cellular respiration is so important. ● Respiration in cells can take place aerobically (using oxygen) or anaerobically (without oxygen), to transfer energy. ● Compare the processes of aerobic and anaerobic respiration with regard to the need for oxygen, the differing products, and the relative amounts of energy transferred. ● Organisms need energy for: ● -chemical reactions to build larger molecules ● -movement ● -keeping warm. ● Aerobic respiration is represented by the equations: glucose + oxygen → carbon dioxide + water ● Pupils should recognise the chemical symbols: $C_6H_{12}O_6$, O_2, CO_2, and H_2O.	https://teachers.thenational.academy/lessons/respiration-71jpce	
	The response to exercise ● Know how your body responds to increase demands for energy during exercise. ● During exercise the human body reacts to the increased demand for energy. ● The heart rate, breathing rate, and breath volume increase during exercise to supply the muscles with more oxygenated blood.		
	Anaerobic respiration ● Know why less energy is transferred by anaerobic respiration that by aerobic respiration. ● Know what is meant by oxygen debt (H) ● Know that anaerobic respiration takes place in lots of different organisms including plants, bacteria and fungi.	https://www.bbc.co.uk/bitesize/guides/zp4mk2p/revision/1 https://teachers.thenational.academy/lessons/anaerobic-respiration-cdgk6d	

	● Respiration in cells can take place aerobically (using oxygen) or anaerobically (without oxygen), to transfer energy. ● Compare the processes o aerobic and anaerobic respiration with regard to the need for oxygen, the differing products, and the relative amounts of energy transferred. ● Anaerobic respiration in muscles is represented by the equation: glucose → lactic acid ● As the oxidation of glucose is incomplete in anaerobic respiration much less energy is transferred than in aerobic respiration. ● Anaerobic respiration in plant and yeast cells is represented by the equation: glucose → ethanol + carbon dioxide ● Anaerobic respiration in yeast cells is called fermentation and has economic importance in the manufacture of bread and alcoholic drinks. ● If insufficient oxygen is supplied, anaerobic respiration takes place in muscles. The incomplete oxidation of glucose causes a buildup of lactic acid and creates an oxygen debt. ● During long periods of vigorous activity muscles become fatigued and stop contracting efficiently. ● Blood flowing through the muscles transports the lactic acid to the liver where it is converted back into glucose. Oxygen debt is the amount of extra oxygen the body needs after exercise to react with the accumulated lactic acid and remove it from the cells. (Higher)	https://teachers.thenational.academy/lessons/consequences-of-anaerobic-respiration-6rr30c	
	Metabolism and the liver ● Know that metabolism is the sum of all the reactions in a cell or the body of an organism ● Know how the liver is involved in repaying oxygen debt. (Higher) ● Blood flowing through the muscles transports the lactic acid to the liver	https://teachers.thenational.academy/lessons/metabolism-6rw3gc https://www.bbc.co.uk/bitesize/guides/zcjy97h/revision/6	

	where it is converted back into glucose. Oxygen debt is the amount of extra oxygen the body needs after exercise to react with the accumulated lactic acid and remove it from the cells. (Higher) ● Know how to explain the importance of sugars, amino acids, fatty acids and glycerol in the synthesis and breakdown of carbohydrates, proteins, and lipids. Metabolism is the sum of all the reactions in a cell or the body. ● The energy transferred by respiration in cells is used by the organism for the continual enzyme-controlled processes of metabolism that synthesise new molecules. ● Metabolism includes: • conversion of glucose to starch, glycogen, and cellulose • the formation of lipid molecules from a molecule of glycerol and three molecules of fatty acids • the use of glucose and nitrate ions to form amino acids which in turn are used to synthesise proteins • respiration • breakdown of excess proteins to form urea for excretion.	https://teachers.thenational.academy/lessons/metabolism-6rw3gc	
P8: Photosynthesis	Photosynthesis ● Know that photosynthesis is represented by the equations: carbon dioxide + water → glucose + oxygen ● Recognise the chemical symbols: CO_2, H_2O, O_2, and $C_6H_{12}O_6$. ● Describe photosynthesis as an endothermic reaction in which energy is transferred from the environment to the chloroplasts by light. ● Describe how the leaf is adapted for photosynthesis. ● Write the balanced symbol equation for photosynthesis. ● Describe an experiment to prove that plants carry out photosynthesis when exposed to light. ● Explain how adaptations of the leaf make photosynthesis efficient.	https://www.youtube.com/playlist?list=PLAd0MSIZBSsF3vV_uxzbcNHuDrQ6Hc-Ul https://www.bbc.co.uk/bitesize/guides/zs4mk2p/revision/1	

	● Explain why photosynthesis is an endothermic reaction. ● Explain why chlorophyll is needed for photosynthesis.		
	The rate of photosynthesis ● Explain the effects of temperature, light intensity, carbon dioxide concentration, and the amount of chlorophyll on the rate of photosynthesis. ● Measure and calculate rates of photosynthesis ● Extract and interpret graphs of photosynthesis rate involving one limiting factor ● Plot and draw appropriate graphs selecting appropriate scale for axes ● Translate information between graphical and numeric form. ● These factors interact and any one of them may be the factor that limits photosynthesis. ● Know how to explain graphs of photosynthesis rate involving two or three factors and decide which the limiting factor is. ● Understand and use inverse proportion – the inverse square law and light intensity in the context of photosynthesis.	https://www.youtube.com/playlist?list=PLAd0MSIZBSsF3vV_uxzbcNHuDrQ6Hc-Ul https://www.youtube.com/watch?v=id0aO_OdFwA	
	How plants use glucose ● Know that the glucose produced in photosynthesis may be: • used for respiration • converted into insoluble starch for storage • used to produce fat or oil for storage • used to produce cellulose, which strengthens the cell wall • used to produce amino acids for protein synthesis. ● To produce proteins, plants also use nitrate ions that are absorbed from the soil. ● Describe all the ways in which plants use glucose, including how they make proteins. ● Evaluate risks involved in the starch test. ● Explain how carnivorous plants are adapted to their environment.	https://www.youtube.com/watch?v=e_V7h37vI3Q https://www.youtube.com/watch?v=Q5rsuwMDCXY	

	● Explain how and why plants convert glucose to starch for storage.		
	Making the most of photosynthesis ● Know how limiting factors are important in the economics of enhancing the conditions in greenhouses to gain the maximum rate of photosynthesis whilst still maintaining profit ● Describe why greenhouses increase plant growth. ● Comment on the cost-effectiveness of adding heat, light, or carbon dioxide to greenhouses. ● Discuss the benefits of using greenhouses and hydroponics. ● Explain in detail how using greenhouses can help control limiting factors and increase the rate of photosynthesis. ● Use data to comment on the cost-effectiveness of greenhouses. ● Evaluate the use of greenhouses and hydroponics in terms of economics.	https://www.bbc.co.uk/bitesize/guides/zs4mk2p/revision/8 https://www.youtube.com/watch?v=g4ycIfVBKOo	

Spanish

Topic: *Mi gente*- My family and friends

Aims:

- Pupils will be able to read, listen, write and speak using vocabulary on the topic of family and friends.
- Pupils will learn to use a range of relationship verbs and direct object pronouns to improve flow of writing.
- Pupils will be able to improvise dialogues and recognise similar ideas expressed differently.
- Pupils will be able to consolidate and extend their grammatical knowledge of the following features:
  - The use of possessive adjectives *mi/tu/su/ nuestro/vuestro/su.*
  - The use of comparatives.
  - The use of stem changing verbs *poder* and *querer.*
  - The use of the present continuous.
  - The use of the reflexive verbs for relationships.

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
Who am I?	● Describing people. ● Talking about socialising and family. ● <u>Grammar:</u> -Using adjectival agreement. - Using verbs in the present tense. - Stem changing verbs (*poder*, *querer*). - Possessive adjectives (*mi, tu, su, nuestro, vuestro, su*). - Using comparatives.	https://classroom.thenational.academy/lessons/talking-about-relationships-part-13-ctk6ct https://classroom.thenational.academy/lessons/talking-about-relationships-part-23-6tk6ae https://classroom.thenational.academy/lessons/talking-about-relationships-part-33-6grk4c	
What are your favourite applications?	● Talking about social networks. ● Extending responses by referring to others. ● <u>Grammar:</u> - Using *para* with infinitives.	https://classroom.thenational.academy/lessons/talk-about-social-media-part-13-cgw66c https://classroom.thenational.academy/lessons/null-c4t38e https://classroom.thenational.academy/lessons/talk-about-social-media-part-33-cnjk6d	
What are you doing?	● Making arrangements. ● Improvising dialogues. ● <u>Grammar:</u> - Using the present continuous.	https://classroom.thenational.academy/lessons/making-arrangements-part-13-6rrpar https://classroom.thenational.academy/lessons/making-arrangements-part-23-71gp6c https://classroom.thenational.academy/lessons/making-arrangements-part-33-cgtkat	
Do you like reading?	● Talking about reading preferences. ● Recognising similar ideas expressed	https://classroom.thenational.academy/lessons/reading-preferences-part-13-6xk68d	

	differently. ● <u>Grammar:</u> - Using a range of connectives.	https://classroom.thenational.academy/lessons/reading-preferences-part-23-64wk4d https://classroom.thenational.academy/lessons/reading-preferences-part-33-6xjpcd	
What do you look like?	● Talking about friends and family. ● Understanding more detailed descriptions. ● Using similes and specific details to extend writing. ● <u>Grammar:</u> -Using *ser* and *estar.* - Referring to the present and past. -Reflexive verbs for relationships.	https://classroom.thenational.academy/lessons/describing-people-part-13-64v38c https://classroom.thenational.academy/lessons/describing-people-part-23-68v3je https://classroom.thenational.academy/lessons/describing-people-part-33-60wkge https://classroom.thenational.academy/lessons/guided-writing-foundation-74tp2t https://classroom.thenational.academy/lessons/guided-writing-higher-6rvp8c	

History

Topic: Crime and Punishment

Aims:

- Pupils will be able to describe Crime and Punishment over the period c. 500 to the Present Day
- Pupils will be able to assess change and continuity in crime, punishment, policing and attitudes over the time period

NB – All content for this unit can be found on BBC Bitesize by following the link below, you may wish to follow the suggested order on this site https://www.bbc.co.uk/bitesize/topics/zpp3srd. The content below has been split to follow the lesson order as we would learn it in class. Additionally, the exam board have their own revision resource which you can read through here - https://resource.download.wjec.co.uk/vtc/2016-17/16-17_2-44/pdf/crime%26pinishment-document.pdf

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
What was crime like in the medieval period?	● Most people lived in poverty. Their lives were made worse by famine, disease and war. These causes of poverty continued until the 19th Century. ● Poverty lead to theft of property, but also revolts and rebellions. ● As more trade developed, roads were used more often encouraging highway robbery. ● Violent crime was also common because people had access to weapons and tools. 20% of crime was murder and manslaughter. Theft accounted for 75% of crimes.	https://www.bbc.co.uk/bitesize/guides/zy7nqhv/revision/1 https://www.youtube.com/watch?v=_1Oj8Ag3lhQ For guidance on key terminology focused on change and continuity, it would be worth watching this clip also - https://www.youtube.com/watch?v=IRf-tkRItLc	
How were criminals caught and tried (in the Anglo-Saxon and medieval period)?	• There was no police force in Medieval England so communities had to rely on communal responsibility. • Tithing, the hue and cry and a system of trials were used to keep law and order. • Constables were appointed to track down criminals. • There was a developed court system – manor courts, church courts and royal courts all dealt with different matters. • Crime was deterred by the role of the church. It was	https://www.bbc.co.uk/bitesize/guides/zy7nqhv/revision/2 https://www.bbc.co.uk/bitesize/guides/zy7nqhv/revision/3 https://www.youtube.com/watch?v=IUa4u0N0MCY	

	sinful to commit crimes and everyone wanted to go to heaven		
What were Anglo-Saxon and medieval punishments like?	● When someone was accused of a crime they faced trial by jury. Trial by ordeal was only used if a decision could not be made. These are seen as crimes rather than punishments. ● Many punishments existed at the time. The most common was hanging, paying a fine (wergild) and blood feud (where the victim's family could take revenge on the wrongdoer).	https://www.bbc.co.uk/bitesize/guides/z9f4srd/revision/1 https://www.youtube.com/watch?v=snVbGOrHZaY&t=15s	
What were the causes and nature of crime in the Early Modern period?	● In the Early Modern period society was affected by a rise in poverty. The reasons for this include increase in population, inflation, closing of the monasteries and changes in farming. ● A move from the countryside to the towns of England increased crime, especially the rise of vagrancy. This became a big problem especially under Elizabeth I (1558-1601). ● An increasing importance placed on religion during the Reformation led to more religiously motivated crimes and the government clamping down on them i.e. heresy, witchcraft and treason (gunpowder plot). ● Other crimes include smuggling, highway robbery and poaching.	https://www.bbc.co.uk/bitesize/guides/zy7nqhv/revision/6 https://www.bbc.co.uk/bitesize/guides/z2cqrwx/revision/1 https://www.bbc.co.uk/bitesize/guides/z2cqrwx/revision/2 https://www.bbc.co.uk/bitesize/guides/zy7nqhv/video https://www.youtube.com/watch?v=x25DfYflW2g	
How effective was policing Early Modern Britain?	● By the 1500s the system of medieval policing still worked in rural communities, but not I towns. ● Constables and sheriffs were phased out in favour of Justices of the Peace. Night Watchmen patrolled towns and Parish Constables helped to deal with the problems of poverty. ● The role of the JP is important in this period (Justice of the Peace). ● By the mid-1600s the beginnings of paid policing roles were evident in the Charleys. ● Many people still feared the interference of a police force within their private lives.	https://www.bbc.co.uk/bitesize/guides/z9y9fcw/revision/1 https://www.youtube.com/watch?v=Rj7amy5uFfQ&t=16s https://www.bbc.co.uk/bitesize/guides/z9f4srd/video	
Why did punishments become harsher in the	● Painful and humiliating punishments remained such as the pillories (stocks), whipping and flogging.	https://www.bbc.co.uk/bitesize/guides/z9f4srd/revision/1	

period 1500-1750?	● Mutilation was used to send out a message to repeat offenders i.e. cutting of a hand, ear or nose. ● Treason resulted in the particularly harsh punishment of hanging, drawing and quartering. Most ordinary criminals continued to be hanged. ● The introduction of the Bloody Code was a big change making punishments harsher after 1688 – many small crimes were punishable by death.	https://www.youtube.com/watch?v=TK5FzUPLrwg	
What was the truth about witches in the 1600s?	● Witchcraft was a new type of crime in the 1600s which emerged due to religious tensions. ● Anyone could be accused of being a witch and would undergo a trial which could be both painful and humiliating. Most of those accused were women. ● Matthew Hopkins was employed as a witch-finder and King James believed in witches, he even wrote a book about them. ● Superstitious beliefs underpinned the belief in witchcraft. The lack of scientific understanding led to poor harvests, illness and bad fortune being blamed on the actions of witches.	https://www.bbc.co.uk/bitesize/guides/zy7nqhv/revision/4 https://www.youtube.com/watch?v=exFfYlqvKmU https://www.youtube.com/watch?v=HS9fH9UtQOg	
How should you punish a gunpowder plotter?	● When King James took the throne in 1603 there was still much religious tension. The gunpowder plot was an attempt by Catholics to blow up Parliament with James and MPs sitting inside. ● The plot was uncovered and Guy Fawkes – found at the scene of the crime was harshly punished by being put on the rack. ● This sent out a message to others not to plot against the king or carry out religious crimes. For this reason, the gunpowder plot became the last Catholic plot against a king.	https://www.bbc.co.uk/bitesize/guides/zy7nqhv/revision/4 https://www.youtube.com/watch?v=8gZgTDPsGJw	
How did Britain change during the Industrial Revolution?	● Britain became an industrialised country as a result of the Industrial Revolution. ● The population rose from 16 million to 42 million by 1900 which led to increased food prices, less jobs and overcrowding the cities – particularly London. This led to more crime. ● Poor living and working conditions led to a number of	https://www.bbc.co.uk/bitesize/guides/zy7nqhv/revision/5 https://www.bbc.co.uk/bitesize/guides/z2cqrwx/revision/5 https://www.youtube.com/watch?v=c639-sZAj5o	

	riots, protests, and other new crimes such as smuggling emerged. This is linked to an increase in trade across the British Empire.		
What were the causes of protest and government reactions to it?	● There were a number of key protests and riots such as the Luddites, Chartists, Rebecca Riots and Swing Riots. ● Punishment was often harsh, including transportation to Australia. ● The government's harsh reaction was based on their fears linked to the French Revolution which saw the upper classes being unseated and attacked violently by the growing strength of the working class.	https://www.bbc.co.uk/bitesize/guides/z2cqrwx/revision/7 https://www.youtube.com/watch?v=q9trALPRYAc	
How successful was transportation as a punishment?	● Transportation to America was replaced by transportation to Australia for criminals. ● The government's reasons for this punishment being used including them wanting to claim Australia as part of the British Empire. ● Despite harsh conditions and having to settle the colony through creating housing and communities the Australian penal colony survived. ● Many non-criminals also took the journey to Australia. ● The alternative to transportation was hanging which was seen as a harsher crime as it allowed no second chance.	https://www.bbc.co.uk/bitesize/guides/z938v9g/revision/4 https://www.bbc.co.uk/bitesize/guides/z8bd3k7/revision/5 https://www.youtube.com/watch?v=GS1072MshS0	
What changes were made to prisons in the 19th Century?	● Prisons were unfit for their purpose in the 19th Century. They were taken over by the government in the 1870s and a number of reformers campaigned for improved conditions. ● Running water, clean conditions, access to a priest, and separation of men, women and children were some of the changes which improved prisons. ● However there continued to be debate about the separate and silent systems, time off for good behaviour and pointless vs useful work. Prisons were now used much more frequently as a form of punishment.	https://www.bbc.co.uk/bitesize/guides/z8bd3k7/revision/6 https://www.youtube.com/watch?v=VRnTEBHkhk4 https://www.youtube.com/watch?v=aJ1D63-mNTw	
Why was the first	● The Metropolitan Police force was set up in 1829 and	https://www.bbc.co.uk/bitesize/guides/z9f4srd/revision/3	

police force set up in 1829?	marked a massive change in enforcing law and order as it continues to be the main method of dealing with crime. ● The setting up of a police force grew out of the Bow Street Runners who were paid to patrol and deal with criminals in the East End of London. ● The setting up of the police was put into law by Robert Peel and rolled out across the country. ● However the early police force were not well equipped for the task and over time new equipment, uniform, techniques and the establishment of a detective branch allowed for further improvement which sees the police force developing into the one we have today.	https://www.bbc.co.uk/bitesize/guides/z9y9fcw/revision/3 https://www.youtube.com/watch?v=0KA2dbDtFnA&t=100s	
What changes occurred to crime in the 20th Century?	● There are a number of new crimes to emerge during this period. This is largely based on technology including the development of the car and computer technology. ● Computer crime has developed because of the invention of the internet in the 1990s and online banking creating opportunities for online fraud, identity theft and hacking. ● Cars became popular in the 1930s. New crimes include driving without a license, road tax, car theft, speeding, drink driving. ● Hate crime has been a new crime since 2007 - motivated by the victim's religion, race or sexuality. ● Terrorism is also a crime categorised in the 20th and 21st Centuries influenced by the IRA and ISIS. ● Hooliganism is also a new type of crime.	https://www.bbc.co.uk/bitesize/guides/zy7nqhv/revision/7 https://www.bbc.co.uk/bitesize/guides/zy7nqhv/revision/9 https://www.bbc.co.uk/bitesize/guides/z2cqrwx/revision/8 https://www.youtube.com/watch?v=IITY2XukZek	
What have been the biggest changes to policing since 1900?	● Developments in communication through the telephone, radios, 999 number, cars have led to improvements in catching criminals. ● Use of photography, fingerprinting and DNA have led to improvements in catching criminals. ● Specialist units such as fraud squad, dog handling units, anti-terrorism, female officers and better training have seen improvements to techniques for	https://www.bbc.co.uk/bitesize/guides/z9f4srd/revision/5 https://www.youtube.com/watch?v=qaW6vbPjKuA	

	preventing, catching and punishing criminals.		
How have punishments changed since the 1900s?	● Prison reform continued into the 20th Century with reforms such as creating borstals (youth prisons), parole, open prisons and prison courses. ● Community service, courses for drink-driving and points on a licence have also been used to attempt to reform criminal behaviour. The focus is on rehabilitation rather than humiliation.	https://www.bbc.co.uk/bitesize/guides/z8bd3k7/revision/9 https://www.bbc.co.uk/bitesize/guides/z8bd3k7/video	
Why was the death penalty abolished in 1965?	● A major change was the abolition of the death penalty in 1965. ● This was largely influenced by the cases of Derek Bentley, Ruth Ellis and Timothy Evans. ● Arguments for abolishing the death penalty continue with other countries around the world still having this in place.	https://www.bbc.co.uk/bitesize/guides/z8bd3k7/revision/9 https://www.youtube.com/watch?v=qqo0vYvrSPU	

Religious Studies

Topic: Religion and Human Rights

Aims:

- Pupils will be able to use key terminology and debate topics around Human Rights.
- Pupils will be able to form judgements on a number of issues involving rights, discrimination, wealth and social justice.

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
What is meant by Human Rights)?	● Human beings have a right to basic needs. This has been set out in the UN Convention on Human Rights, and is supported by the Human Rights Act and the European Convention on Human Rights. ● Rights come hand in hand with responsibilities. Those who do not have basic rights such as water, access to food, a fair trial is usually because responsibilities are not taken seriously. • Social justice is the idea that everyone should be able to live lives free from extreme poverty and with basic liberties.	https://classroom.thenational.academy/lessons/social-justice-and-human-rights-65gkar	
Why do people discriminate and how can we stop it?	● Prejudice is when a person thinks negatively against another due to their religion, skin colour, gender and a disability. ● Religious believers think that discrimination is wrong. Discrimination – acting upon a prejudice is also wrong because it means a person does not have their full rights. ● Religious believers should act to stop prejudice and discrimination to ensure social justice for all.	https://classroom.thenational.academy/lessons/prejudice-and-discrimination-6wvk0d	
Should religious people openly express their beliefs?	● Religious believers may choose to express their faith openly. They could do this by wearing a cross necklace, a hijab or head covering. This is common in many religions. ● Religious expression should be allowed, unless it	https://classroom.thenational.academy/lessons/religious-freedom-and-censorship-68u3ed	

	infringes on the rights of another person or stops someone from performing their duty. ● There are many examples where religious expression might infringe on the rights of other people and it is important to have an idea of what is acceptable or not. ● Both Christianity and Islam believe in showing and sharing faith. However, they also admit that there are times when religious ideas conflict with law and can cause tension. ● Each religious believer should decide to what extent they feel expression is necessary.		
What does religion say about poverty and wealth?	● In Islam and Christianity they recognise the role of the wealthy and poor. Those with more money are expected to give money to those who are not well off. ● It is a duty in both Christianity and Islam. Within Islam, it is one of the five pillars of faith (zakah) so should be taken seriously. ● It is easier for a person with less wealth to enter heaven because they are not worried about worldly riches but focus on living according to God's rules. ● Money should be earned in an honest way – for example it should not be the case that a person profits at the expense of another person.	https://classroom.thenational.academy/lessons/poverty-and-its-causes-71jp2d https://classroom.thenational.academy/lessons/attitudes-to-wealth-cth64c	
Why should religious believers give to charity?	● It is a duty in both Christianity and Islam. Within Islam, it is one of the five pillars of faith (zakah) so should be taken seriously. ● There are a number of Christian and Islamic charities set up with the purpose of helping others of that faith i.e. Christian Aid, CAFOD, Islamic Relief, Muslim Aid. ● This money can be used for both long and short term aid. Long term aid can help relieve poverty in the long term (over a longer period of time) however, short term aid might be needed in emergencies such as earthquakes and flooding ● This aid can help to save lives by providing essential food, shelter and medical treatment. This links to the religious teachings of helping others and ensuring people's lives are saved (sanctity of life).	https://classroom.thenational.academy/lessons/giving-money-to-the-poor-cthk6e	

Physical Education

Topic: Commercialisation of physical activity and sport

Aims:

- Pupils will be able to understand the idea of commercialisation and the relationship between sport, sponsorship and media.
- Pupils will be able to understand the positive and negative impacts of sponsorship, the media and technology.

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
Commercialisation of physical activity and sport	● Define commercialisation. ● Explain commercialisation. ● Analyse/ evaluate links between sport, sponsorship and the media.	https://www.bbc.co.uk/bitesize/guides/zp2jxsg https://www.bbc.co.uk/bitesize/guides/zsx7tyc https://www.youtube.com/watch?v=lz1MHuW-9Yc	
Positive and negative impacts of sponsorship and the media.	● Provide basic advantages and disadvantages of commercialised activity to the varying groups. ● Develop a breadth of understanding, i.e. several advantages and disadvantages. ● Evaluate the advantages and disadvantages.	https://www.youtube.com/watch?v=3cGdjLt4-aE https://www.bbc.co.uk/bitesize/guides/zp2jxsg/revision/3	
Positive and negative impacts of technology.	● Provide basic advantages and disadvantages of technology in sport to the varying groups. ● Develop a breadth of understanding, i.e. several advantages and disadvantages. ● Evaluate the advantages and disadvantages, with applied examples to varying sports.	https://www.youtube.com/watch?v=A63vm4dy2iQ https://www.youtube.com/watch?v=JA5ptKSd9QA	

Topic: i) Ethical issues & ii) Health & fitness

Aims:

- Pupils will be able to understand the different prohibited substances and methods that certain types of performers may use.
- Pupils will be able to understand the positive and negative effects of spectators at events.
- Linking participation in physical activity, sport & exercise to fitness, health & wellbeing.
- Consequences of a sedentary lifestyle & the impact on obesity.
- The role of a balanced diet on health, wellbeing & sporting performance.
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Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
Prohibited substances (including blood doping).	Know the terms. Explain the terms – what are they? ● Full application comes below. ● How blood doping is carried out. ● Side effects of blood doping. ● Evaluation of the advantages of blood doping, with reasoned conclusions.	https://www.bbc.co.uk/bitesize/guides/zwfg87h/revision/1 https://www.youtube.com/watch?v=w0G_fZf9FaY https://www.youtube.com/watch?v=EZMw3XGYjHA	
Which type of performers may use different types of performance enhancing drugs (PEDs) with sporting examples. Including drugs subject to certain restrictions (beta blockers).	● Evaluate the use of PEDs, which athletes would they benefit, with reasoned conclusions. ● Know the term beta blockers. ● Explain what they are. ● Understand the advantages/ disadvantages. ● Evaluate which type of sports person may take them.	https://youtu.be/h138jqMY8LI https://youtu.be/kKFC61RJ4Gc https://youtu.be/z466itSHE58	

Spectator behaviour (the positive and the negative effects of spectators at events). Strategies employed to combat hooliganism/ spectator behaviour.	Develop an understanding of the advantages and disadvantages generically. ● Apply to varying examples. ● Recap of previous knowledge. ● Develop understanding of varying strategies. Apply this understanding to different sporting events. Develop reasoned conclusions to evaluate the effectiveness of these strategies.	https://www.bbc.co.uk/bitesize/guides/zwcb9qt/revision/2 https://www.youtube.com/watch?v=fehHtDcm9eM https://www.youtube.com/watch?v=8Tpqxx8vtJM	
The consequences of a sedentary lifestyle.	● Understand the terms. ● Explain the terms. ● Apply knowledge of the terms to consequences.	https://youtu.be/N3TMhxlaiac https://www.youtube.com/watch?v=sNI0sNI-o60	
Obesity and how it may affect performance in physical activity and sport & somatotypes.	● Knowledge of what obesity is. ● Basic understanding of how it affects performance. ● Specific links to how it affects the aspects of health. ● Know the body type names. ● Explanation of each body type. ● Application to varying sporting examples. ● Evaluate the appropriateness of the body types to sporting examples with reasoned justifications.	https://youtu.be/W2ZUi73039A https://www.bbc.co.uk/bitesize/guides/zckcdmn/revision/1 https://www.bbc.co.uk/bitesize/guides/zxj87hv/revision/2	
Nutrition – the role of carbohydrates, fat, protein and	● Understand the constituents of a balanced diet. ● Understand the recommended %	https://youtu.be/X6CqyBU-qto https://www.bbc.co.uk/bitesize/guides/zyp6sg8	

vitamins/minerals (including hydration).	intake. ● Evaluate the importance of each element. ● Knowledge of the term dehydration. ● Knowledge of the consequences. Evaluate why water intake is required, making reasoned conclusions.	https://www.bbc.co.uk/bitesize/guides/z3fpv4j	

Drama

Topic: Component 3: 'Blue Stockings' 2 – Depth, Detail and the Exam

Aims:

- Pupils will be able to describe in fine detail the key moments in the play and suggest a director's response to delivery
- Pupils will be able to use a formulaic approach to gaining more marks for questions from Component 3 Part A

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
What are the key events in Act 2 Scene 1? What is the nature of the 5 key questions to Part A?	● The tenure scene ● A) Performer questions, B) Director questions, C) Designer question and their suitable time limits under exam conditions ● One formula for answering a 3ai question on 2:1	https://www.youtube.com/watch?v=FKgTM4a6Nhg	
What does a high mark director question response look like? What does a high mark design question response look like?	● Differentiating writing style for director questions ● The Telescope scene ● The complex relationship between the characters Will and Tess	https://www.youtube.com/watch?v=S7mfKW1j_gM https://www.youtube.com/watch?v=lNVwH8cQ8CQ&t=38s (NB/ The example given here is for a different text option)	
What are the options for the 14 mark question? Approaching the costume option	● The articles of clothing typical of the Victorian and Edwardian eras fir men and women ● Terminology associated with costume design for theatre ● Embedding contextual detail for character, plot and era into design choices ● The Bread and Circuses scene ● The Outcasts scene	https://www.youtube.com/watch?v=136i2T0cpwo (NB/ The example given here is for a different text option) https://www.youtube.com/watch?v=C5W09To7gdY	
Gaining full marks for the first 10 Marks available in Section A – the 4 marker and 6 marker	● The Raising the Banner scene ● 5 key forms of lighting to apply to any design answer ● Answering the 12 marker for full marks in	https://www.youtube.com/watch?v=HUkCvej6UOw	

What are the forms of lighting suitable for use in answering a design question for the 'Bluestockings' text? How can I hone exam technique for the 12 mark question?	areas of voice, physicality and stage space. A formulaic way of gaining full marks in the least amount of time.		
How does 2:7 draw the audience's attention to the politics at play as part of the cultural context? How does 2:8 clarify and change the audience's attitude to male characters in the play?	● The Emergency Summit scene ● The King of Hearts Scene ● Using formulas to answer the first half of Section A under timed conditions ● The answer booklet	https://www.youtube.com/watch?v=FKgTM4a6Nhg&t=372s (Key section starts at 1hour 29) https://qualifications.pearson.com/content/dam/pdf/GCSE/Drama/2016/exam-materials/1DR0_03_que_20180519.pdf	
How does the relationship between Tess and Will develop through the play? Setting and Text Analysis Using the formulas for 3ai, 3aii and 3bi	● The Broken Hearts scene ● The cloze procedure for 3ai, 3aii and 3bi. ● The Viva scene – education and gender ● Enriching ideas through props and stage furniture ● Comprehensive key terminology for lighting and sound options	https://www.youtube.com/watch?v=azvMXjBcVUc (NB/ The example given here is for a different text option)	
Which scene provides the highest moment of climax in the play? How is tension manipulated throughout 2:11?	● The Voting Day scene ● Enriching tension as an actor and designer in 2:11 ● The ending of the play and its meaning ● Choosing between love and knowledge	https://www.youtube.com/watch?v=03xGSr5CVk4&t=1311s (from 2 hours, 2 minutes – end of recording)	

Topic: An Introduction to Component 3: 'Blue Stockings

Aims:

- Pupils will be able to describe the key events, issues and overarching meaning of the play from an actor's perspective
- Pupils will be able to use new terminology to add depth and sophistication to some exam style questions for Component 3 Part A.

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
What is involved in Component 3 of the GCSE course? What is the contextual backdrop to the core text?	● An overview of the written examination ● Victorian and Edwardian attitudes to women and women in education ● Dr Maudsley's theories on women and education ● The opening scenes of 'Blue Stockings'	https://www.youtube.com/watch?v=sAvnQA600PU https://www.youtube.com/watch?v=kYHsYBa-tGQ https://www.youtube.com/watch?v=ZZ3lggZm8Dw	
What typifies the core characteristics of the 4 central roles? What is involved in a 3ai exam question?	● How to adjust stance, facial expression, movement, action, gesture and voice to suit the characters of Tess, Carolyn, Celia and Maeve ● AO1 criteria in the 4 mark question ● Qualities of movement and non-verbal communication	https://www.youtube.com/watch?v=03xGSr5CVk4 (3 minutes – 9 minutes) https://www.youtube.com/watch?v=aa8jTCpEqBM	
What are the core plot developments up to and including 'The Arrival'? How can I develop the key skills for a 3ai question to satisfy the needs of the 12 marker?	● The meeting of the main characters ● The first joint lecture ● The fall out from the lecture ● The seminar on the nature and function of women learning ● The developing relationships between the women ● Ralph's move on Tess ● Billy's arrival ● How to sequence the 12 marker across areas of voice, physicality and stage directions / stage space	https://www.youtube.com/watch?v=03xGSr5CVk4	
How do you mark the 12 mark question? What is involved in a 3bi question?	● Using the marking criteria to peer assess the 12 marker ● The costume, sound and lighting options involved in 3bi ● Recognising forms of technical and naturalistic sound in theatrical performance	https://www.youtube.com/watch?v=MGtX9P8gDI8 https://www.youtube.com/watch?v=GV3XqnZh-4I https://www.youtube.com/watch?v=hFM4hPgGZuk	

	such as recorded sound, sound collages and soundscapes	https://qualifications.pearson.com/content/dam/pdf/GCSE/Drama/2016/Specification%20and%20sample%20assessments/GCSE_Drama_glossary.pdf (page 9 only)	
What are the less familiar terms pertinent to answers in Component 3, what do they mean and how can I use them?	● A detailed understanding of Celia's speech in Act 2 Scene 9 ● The difference between dramatic and situational irony in GCSE Drama ● Isolation as a term in the context of Drama ● Writing with specific features of mannerisms	https://qualifications.pearson.com/content/dam/pdf/GCSE/Drama/2016/Specification%20and%20sample%20assessments/GCSE_Drama_glossary.pdf	
What are the forms of lighting and relevant terms needed in order to answer the lighting option for 3bi? What is crucial content for gaining the most marks in the shortest time?	● The costume, sound and lighting options involved in 3bi ● Lighting in Edwardian Britain ● Conveying status through lighting ● Features of a full marks answer to 3bi	https://qualifications.pearson.com/content/dam/pdf/GCSE/Drama/2016/Specification%20and%20sample%20assessments/GCSE_Drama_glossary.pdf (page 5-6 only)	
What are the forms of lighting and relevant terms needed in order to answer the staging option for 3bi? How can the actors' performance of the final scene of 'Blue Stockings' contribute to its impact on the audience?	● The staging component of the 9 mark question ● The intended impact of the final scene, 'If you had to choose' ● Attitudes to women and the nature and purpose of education ● Links between the context of the Edwardian setting and continued struggles for gender equality	https://www.youtube.com/watch?v=UjI_bspcUHA https://www.youtube.com/watch?v=gkjW9PZBRfk https://www.youtube.com/watch?v=NKckKStggSY	

Art and Design

Topic: Natural Form

Aims:

- To explore, develop and refine skills, knowledge and understanding through the application of techniques and processes.
- To synthesise the work of historical and contemporary Artists and own exploration of a theme through critical and contextual analysis
- To use a range of processes to create a highly personalised outcome related to the theme of Reflection

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
To research and understand the theme in order to develop ideas. To visually respond to the theme. Initial recordings.	● Pupils need to research the theme of natural form in the form of a mind map and a visual mood board. ● Pupils need to create recordings in a range of media linked to the theme.	https://www.youtube.com/watch?v=-S7kVgV8TFw https://www.youtube.com/watch?v=I7bnTMglV0M	
To visually analyse the work of others. To critically analyse the work of others.	● Pupils need to select two artists and record sections of their work replicating the style and using a range of techniques. ● Pupils need to analyse artists work answering a range of questions to understand the meaning and function of the work.	https://www.bbc.co.uk/bitesize/guides/z2hp3k7/revision/4 https://www.bbc.co.uk/bitesize/guides/zgtngdm/revision/1 https://ibdpvawithmissa.blog/visual-arts-journal-examples/	

To respond to the theme using photography taking inspiration from selected artists. To record ideas from photographs.	● Pupils should be taught to use a range of techniques and media, including painting‘ ● Pupils need to take a selection of photographs in the style of their artists to work from. ● Pupils need to select the most successful photographs and record them in the style of their artist to present their ideas in line with the theme.	https://felt-tip-pen.com/artist-study-sonia-delaunay/ https://www.bbc.co.uk/bitesize/guides/zgwpnbk/revision/1 https://www.bbc.co.uk/bitesize/guides/zc7sfrd/revision/1 https://www.youtube.com/watch?v=-_hCqIZM4s0 https://www.youtube.com/watch?v=0PmeEatbNe8&t=351s https://www.youtube.com/watch?v=L8novBL_i1w	
To develop ideas. To develop photography. Final photographs.	● Pupils need to push and develop individual ideas in a range of media. ● Pupils need to take improved photographs.	https://www.bbc.co.uk/bitesize/guides/zc7mng8/revision/1 https://www.youtube.com/watch?v=L8novBL_i1w	
To respond to photographs and experiment with different media. To create a mock outcome.	● Pupils need to experiment with media and composition to develop at least two final ideas. ● Pupils need to select and refine/improve most successful developed idea.	https://www.bbc.co.uk/bitesize/guides/z8pfcj6/revision/8 https://www.bbc.co.uk/bitesize/guides/zc7sfrd/revision/1 https://www.youtube.com/watch?v=PKCsjNh6EPM https://www.youtube.com/watch?v=NGhn6oWirNQ	
To create a final outcome. To complete final outcome and assess.	● Pupils to create a final outcome. ● Pupils need to create and assess their final outcome.	https://www.bbc.co.uk/bitesize/guides/zymtv9q/revision/1 https://www.bbc.co.uk/bitesize/guides/zpcndxs/revision/1	

Photography

Topic: 'Reflections' – Identity

Aims:

- To explore, develop and refine skills, knowledge and understanding through the application of techniques and processes.
- To synthesise the work of historical and contemporary Artists/Photographers and own exploration of a theme through critical and contextual analysis
- To use a range of processes to create a highly personalised outcome related to the theme of 'Reflections'.
-

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
To be able to use the 6 rules of composition to take effective photographs. To know the definitions of the key terms used to describe the 6 rules of composition.	● Introduce and explore the 6 rules of composition. ● Develop a brief photoshoot plan for each of the 6 rules. ● Pupils will then take portrait photographs for each of the 6 rules of composition.	Understanding the Rule of Thirds (photographytalk.com) YOU NEED THIS! - How to find and use LEADING LINES - YouTube (38) Pinterest	
To learn about the; Destroy' series by photographer Rankin. To develop understanding of Photomontage techniques	● Explore the work of photographer 'Rankin' Destroy series. ● To produce photomontages inspired by Rankin's Destroy series by manipulating photographs based on the 6 rules of	Rankin Destroy (photopedagogy.com) Rankin Destroy: Creating an Inspired Response - YouTube https://www.photopedagogy.com/rankin-destroy.html http://www.dazeddigital.com/photography/article/5791/1/destroy-by-rankin	

	composition. ● Refine experiments by selecting materials and techniques (ripping, collaging, and layering) to manipulate their photographs.		
To know, develop and explore shutter speed. To take photographs to show frozen and suggestive movement.	● To explore what is shutter speed? How do you produce frozen and suggestive movement? ● Pupils to take a combination of frozen and suggestive movement portraits based on their research and camera settings.	What is Shutter Speed? (creativelive.com) Camera Basics - Shutter Speed - YouTube RJ MUNA PICTURES https://www.youtube.com/watch?v=Cqse6i2qWTU	
Development of shutter speed into glitching Introduction to 'Photomosh'	● To explore the glitching App 'Photomosh' ● To develop sets of prints or experiments using a variety of Photomosh glitching techniques. ● Refinement – through presentation and annotations.	PhotoMosh photomosh tutorial - Google Search	
Independent Photoshoots: To develop ideas for your independent photo shoot. Introduce statement of Intent	● Explore independent Photographer/Theme through a Moodboard: Select a photographer/theme of your choice. Include key terminology to show further links to the theme Reflection/Identity. ● Statement of Intent: To develop and create a step-by-step plan based on your chosen photographer's/themed work.	www.cuded.com/category/photography thephotographersgallery.org.uk www.saatchigallery.com yellowkorner.com	

To create initial outcomes. To complete final outcomes and assess.	● To refine coursework using prior skills and techniques to produce a series of sets of prints. Pupils can use all photoshoots. ● To experiment with compositional ideas developing into possible initial designs ● Pupils need to select and refine/improve most successful developed idea. ● To develop best sets of prints further into a final outcome.	https://www.bbc.co.uk/bitesize/guides/zpcndxs/revision/1 https://www.bbc.co.uk/bitesize/guides/zymtv9q/revision/1	

Graphics

Topic: Music

Aims:

- To explore, acquire and develop skills, knowledge and understanding through the application of techniques and processes
- To use critical and contextual sources such as the work of historical and contemporary graphic designers and the different purposes, intentions and functions of graphic communication as appropriate to their own work.
- To use a range of process to create an effective design that communicates a clear message

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
Research & Design Brief Learners must explore practical and relevant critical and contextual sources such as the work of historical and contemporary graphic designers and the different purposes, intentions and functions of graphic communication as appropriate to their own work	● Outline of skills linked to the National Curriculum. ● 'Evaluate and analyse creative works using the language of art, craft and design' ● Outline of learning ● Objective To identify and understand the given design brief and its purpose. ● Outcome: ● To produce a mood board and mind map. ● Pupils could explore a range of layout and presentation techniques to communicate a message, such as sketchbooks,	https://www.bbc.co.uk/bitesize/guides/zqpntyc/revision/1#:~:text=The%20starting%20point%20for%20any,on%20will%20solve%20this%20problem. https://teachers.thenational.academy/lessons/exploring-new-media-handwritten-part-1-moodboards-c9jkgd	✓

	presentation sheets or in a digital format.		
Artist exploration and Analysis Learners must explore practical and relevant critical and contextual sources such as the work of historical and contemporary graphic designers and the different purposes, intentions and functions of graphic communication as appropriate to their own work	● Outline of skills linked to the National Curriculum. ● 'Produce creative work, exploring their ideas and recording their experiences' ● Outline of learning ● Knowledge: To develop critical and contextual understanding of two illustrator or graphic designers ● Skills: Develop ideas through investigations, demonstrating critical understanding of sources ● Understanding: To know how to analyse, compare and respond to an Artist ● Pupils investigate and respond to the work of a range of poster designers through written analysis and visual interpretation using a variety of materials. They consider intended audience and the ways in which the graphics are used to communicate ideas, information and capture the mood of a place of interest.	https://www.studentartguide.com/articles/how-to-analyze-an-artwork https://www.bbc.co.uk/bitesize/guides/zymtv9q/revision/1	
Analysis & Experimentation Learners must explore, acquire and develop skills, knowledge and	● Outline of skills linked to the National Curriculum. ● 'Pupils should be taught to develop their creativity and ideas, and increase	https://www.youtube.com/watch?v=yMUmqBU4FDM https://www.youtube.com/watch?v=PLSHweJdR3I	

understanding through the application of techniques and processes specific to their chosen area(s) of study of Graphic Communication	proficiency in their execution.' ● Outline of learning ● Objective: Can I successfully analyse Artist's work through my own Artist response? ● Outcome: A visual exploration of your chosen Artist using a range of appropriate media and techniques		
Media Exploration Learners must explore, acquire and develop skills, knowledge and understanding through the application of techniques and processes specific to their chosen area(s) of study of Graphic Communication	● Outline of skills linked to the National Curriculum. ● 'Become proficient in drawing, painting, sculpture and other art, craft and design techniques' ● They develop skills using a variety of materials and techniques both digital and/or non-digital in response to the collected research.	https://www.youtube.com/watch?v=tH_brmk1jPI https://teachers.thenational.academy/lessons/skills-and-development-part-1-68tp8c	
Idea Development Learners must demonstrate the knowledge, skills and understanding through area(s) of study relevant to Graphic Communication	● 'Pupils should be taught to use a range of techniques to record their observations in sketchbooks, journals and other media as a basis for exploring their ideas' ● Outline of learning ● Knowledge: To know how to self-assess your work in order to independently	https://www.bbc.co.uk/bitesize/guides/zc7mng8/revision/1	

	develop your designs. ● Skills: To record and apply ideas in visual and written forms. ● Understanding: To demonstrate influences from another artist in your own work by creating four design ideas ● They develop ideas for a design influenced by their study of sources and experiments with materials and techniques such as drawing, painting, printmaking, Photoshop and Illustrator (evidence for AO1, AO2 and AO3).		
Final outcome development Learners are required to know and understand how sources inspire the development of their ideas.	● Outline of skills linked to the National Curriculum. ● 'Pupils should be taught to develop their creativity and ideas, and increase proficiency in their execution. ● Outline of learning ● Knowledge: To know how to develop a successful final outcome through development of own ideas and supporting others development. ● Skills: To develop media application skills to support development of ideas. ● Understanding: To review and refine work as it progresses. ● Pupils develop a personal response and produce and present their final poster design proposal using digital or non-	https://www.bbc.co.uk/bitesize/guides/zpcndxs/revision/1	

	digital means. Pupils should also consider the significance of the selected sources studied and their impact on work produced (evidence for AO4)		

Animation

Topic: Animation- Reflection- Environmental issues

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
To research and understand the theme in order to develop ideas.	Pupils need to research the theme of reflection in the form of a min map and a visual mood board.	https://www.youtube.com/watch?v=uDqjIdI4bF4 https://www.intofilm.org/films/filmlist/88?gclid=EAIaIQobChMIitLW-fGY7wIVR7DtCh3DUg9VEAAYASAAEgJ2o_D_BwE https://www.rct.uk/discover/art-history-and-stories?gclid=EAIaIQobChMI_Jrhm_KY7wIVFuvtCh1KsgR_EAAYAiAAEgJyffD_BwE	
To visually respond to the theme. Initial recordings.	Pupils need to create recordings in a range of media linked to the theme.	https://www.bbc.co.uk/bitesize/topics/zpt4qhv https://www.bbc.co.uk/bitesize/guides/zpq3pbk/revision/7 https://classroom.thenational.academy/subjects-by-key-stage/key-stage-4/subjects/art http://stevelowtwait.com/blog/what-is-animation-background-layout https://www.pinterest.com/kamille0609/background-design-for-animation/	
To visually analyse the work of others.	Pupils need to select two Animators and animation film industries and record sections of their work replicating the style and using a range of techniques.	http://stevelowtwait.com/blog/what-is-animation-background-layout https://www.bbc.co.uk/bitesize/guides/zpq3pbk/revision/7	

		https://classroom.thenational.academy/subjects-by-key-stage/key-stage-4/subjects/art	
To critically analyse the work of others.	Pupils need to analyse Animators and animation film industries work answering a range of questions to understand the meaning and function of the work.	https://insidethemagic.net/2020/02/walt-disney-animation-100-years-bb1/	
To respond to the theme using photography taking inspiration from selected Animators and animation film industries.	Pupils need to take a selection of photographs in the style of their Animators and animation film industries to work from.	https://www.bbc.co.uk/bitesize/guides/z8pfcj6/revision/8 https://www.creativeblog.com/colour/digital-colour-mixing-1131629 https://www.clipstudio.net/how-to-draw/archives/161372	
To record ideas from photographs.	Pupils need to select the most successful photographs and record them in the style of their Animators and animation film industries to present their ideas in line with the theme.	https://www.youtube.com/watch?v=a6Kz62IEjyw https://classroom.thenational.academy/units/photography-aee1 https://expertphotography.com/complete-guide-still-life-table-top-photography/	
To develop ideas.	Pupils need to push and develop individual ideas in a range of media.		
To develop photography. Final photographs.	Pupils need to be specific with their photographs continue to improved it in terms of its selected purpose.		
To respond to photographs and experiment with different animation techniques such as; rotoscoping, 3D, 2D, pixilation,	Pupils need to experiment with media and composition to develop a prop and settings model sheet.	https://www.bbc.co.uk/bitesize/guides/ztt99qt/revision/1	

and stop motions			
To create a mock outcome.	Pupils need to select and refine/improve most successful developed idea for a background settings focusing in terms of scale the most popular aspect ratio of 3:2 for their mock piece.	https://www.youtube.com/watch?v=KYycmpfEoBA https://www.peachpit.com/articles/article.aspx?p=27775&seqNum=6 http://stevelowtwait.com/blog/what-is-animation-background-layout https://www.pinterest.com/kamille0609/background-design-for-animation/	
To create a character modelling sheet	Character should relate to pupils animation techniques choice.	https://www.youtube.com/channel/UCAxYH9DWyVmMpS9NgyxoTFQ https://www.youtube.com/watch?v=KYycmpfEoBA https://www.youtube.com/watch?v=VGKBam84ZAA https://www.youtube.com/watch?v=uYfWCHkoF0A https://www.youtube.com/watch?v=wR_cHX_hXgM https://www.youtube.com/watch?v=SVflowNUkJ0 https://www.adobe.com/uk/products/character-animator.html?mv	
To create a story and storyboard	Based on research in terms of the theme “Reflection” pupils will create a short story and produce a story boarding for a 30second animation film.	https://www.youtube.com/watch?v=7huMYp7WpsI https://fredanderic.com/?gclid=EAIaIQobChMIlYW-l-KX7wIVCbLtCh3ThATOEAAYAiAAEgIGo_D_BwE https://www.meetcortex.com/blog/digital-storytelling https://www.powerproduction.com/blog/how-to-create-a-storyboard/ https://www.markmitchellpaintings.com/blog/the-fibonacci-sequence-	

		in-artistic-composition https://www.youtube.com/watch?v=u-SXLaQGg50	
To complete final outcome and assess.	Pupils need to create a short animation film and assess their final outcome.		

I Media

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
Uses of interactive multimedia products	Investigate a wide range of interactive multimedia products (e.g. promotional websites, e-commerce websites, kiosks in museums, digital magazines, town information systems). Explore and take note from your findings from the links provided. Identify the purpose of these interactive multimedia products (e.g. entertainment, information, education, advertising, promotion and create a list to clearly show this information).	http://www.sciencemuseum.org.uk/WhoAmI/Thingdom.Aspx http://heritageinteractive.co.uk/portfolio http://www.mnh.si.edu/panoramas/ http://www.britishmuseum.org/explore/online_tours.aspx http://web.org.uk/black/ http://www.virtualfreesites.com/museums.museums.html http://www.thedropzone.org/index_back.html	
Key elements of interactive multimedia products	Resource links provides ideas of other resources which teachers might find useful to support the delivery of this unit As well as researching from links within the resource document link here, you are to use various resources but due to Covid restrictions mainly utilise online resources to research uses of a variety of IMPs including and you must know examples for each of these: ● Kiosks ● ATMs ● Computer desktop/laptop accessible IMPs ● Internet delivered IMPs ● Mobile phone ● Tablet/iPad	https://www.ocr.org.uk/Images/295364-unit-r087-resources-links.pdf https://mediadynamics.com/work/ http://www.virtualfreesites.com/museums.museums.html http://www.thedropzone.org/index_back.html http://www.bostonchildrensmuseum.org/museumvirtual-tour http://www.smithsonianeducation.org/pupils/idealabs/walking_on_the_moon.html https://www.esa.int/esapub/bulletin/bullet91/b91ciar.htm	

		https://simplicable.com/new/interactive-media	
Hardware, software and peripherals required to create interactive multimedia products	Research using the internet to find different software and hardware used for the creation of the different elements identified in class and homework tasks (e.g. House style, GUI, accessibility tags, images, video, sound, interactive controls, navigation methods). Consider what hardware and software is used to create different interactive multimedia products.	https://coggle.it/diagram/XEG5ZD0qwuNiWC4D/t/hardware%2C-software-creating-and-viewing-multimedia-products https://www.cemca.org/ckfinder/userfiles/files/Section3.pdf https://murdomultimedia.wordpress.com/2010/02/25/what-essential-hardware-and-software-is-required-for-multimedia-development-and-delivery/ https://computingheles.wordpress.com/imedia/r087-creating-interactive-multimedia-products/lo1-understand-the-uses-and-properties-of-interactive-multimedia-products/ https://computingheles.files.wordpress.com/2019/04/creative-imedia-r087.pptx	
Limitations affecting access to interactive multimedia products	Research and identify the different factors such as connection type, bandwidth and data transfer as to how the various types affect access to interactive multimedia products. Using online resources look at existing different interactive multimedia products using different devices and connections i.e. look at the one same website recognised as a IMP using : ● laptop home wifi or broadband connection ● mobile phone and phone data (if available) ● tablet or iPad ● on any other different device	https://www.slideshare.net/mrcmorrison/lesson-3-bandwidth https://www.investopedia.com/terms/i/interactive-media.asp https://www.salesforce.com/blog/category/marketing/?mc=marketingcloud.com/blog/5-interactive-media-examples-of-the-new-mad-men https://www.bbc.co.uk/bitesize/guides/zp9jpv4/revision/4 https://upload.wikimedia.org/wikipedia/commons/0/0a/Interactive_design_in_relation_to_other_fields_of_study.jpg	

	Write notes to describe the differences in the product performance on different devices.	https://www.scad.edu/academics/programs/interactive-design-and-game-development	
Interpreting client and audience requirements Developing work plans Planning the structure of interactive multimedia products	By using experience and online resources, study how different clients or customers specify what they want. You will need to make the distinction between a client (who wants to produce and IMP for customers), and a customer (who needs to use the IMPs. You can study what the client and target audience requirements are. And then consider what these components are the form a brief (a specification document outlining what the IMP must have, must do and how it must operate according to the desired needs and wants) Using online resources, investigate what different types of work plans are used within different industrial sectors. Create your own work plan in Excel spreadsheets using itemised tasks listed horizontally in your personal tracker that you took copies of from the Google Drive. You will need to allocate how long it will take you to complete each task	https://www.intechopen.com/books/interactive-multimedia-multimedia-production-and-digital-storytelling/introductory-chapter-multimedia-and-interaction https://www.singlegrain.com/blog-posts/content-marketing/7-types-of-interactive-content-why-and-how-to-use-them/ https://www.slideshare.net/JamesEdwards1/creative-i-media-r087 https://www.bbc.co.uk/bitesize/guides/zcsky4j/revision/2 https://www.phase2technology.com/blog/successful-requirements-gathering https://usabilitygeek.com/requirements-gathering-user-experience-pt1/ https://blog.atomicsmash.co.uk/blog/the-best-way-to-gather-requirements-for-your-next-digital-project/ http://www.projectlibre.org/ https://www.wrike.com/blog/how-to-write-a-project-plan-easy-steps/	

	knowing that the full coursework allowance is 20 hours total. Research the broad range of IMP structures from the list of links and form ideas, make notes and from a selection choose just a few that you think you will base your IMP on to create.	https://www.teamgantt.com/guide-to-project-management/how-to-plan-a-project https://www.projectmanager.com/blog/make-work-plan https://www.wikihow.com/Write-a-Work-Plan Non-Subscription links: BBCBiteSize (http://www.bbc.co.uk/education/levels/z98jmp3) http://www.sciencemuseum.org.uk/WhoAmI/Thingdom.aspx http://heritageinteractive.co.uk/portfolio http://www.mnh.si.edu/panoramas/ http://www.britishmuseum.org/explore/online_tours.aspx http://www.virtualfreesites.com/museums.museums.html http://www.thedropzone.org/index_back.html http://www.bostonchildrensmuseum.org/museumvirtual-tour http://www.smithsonianeducation.org/pupils/idealabs/walking_on_the_moon.html Design resources http://www.formula-d.co.za/blog/ - brief blog about some points to consider	

		https://balsamiq.com/ - free wire framing tool	
Designing the content of interactive multimedia products Legislation that covers interactive multimedia products	Create visualisation diagrams or storyboards of existing interactive multimedia products annotating colour schemes and various elements. These could be the same products as used previously. Look at and use any of the links within this document that you identify as being suitable for your IMP. You are not restricted to these links only and you can use your own further sourced links.	Take notes from these resources to use: Boardworks (http://www.boardworks.co.uk/) Linguascope (http://www.linguascope.com/) MyMaths (http://www.mymaths.co.uk/) https://www.google.com/search?source=univ&tbm=isch&q=visualisation+diagram+interactive+multimedia+product&safe=strict&sa=X&ved=2ahUKEwj9s6-gh6vvAhUQTcAKHadSDA0Q7Al6BAgkEEw&biw=1280&bih=824 https://www.google.com/search?q=story+boards+interactive+multimedia+product&tbm=isch&ved=2ahUKEwj4g4iwh6vvAhUC2eAKHcXzAFQQ2-cCegQIABAA&oq=story+boards+interactive+multimedia+product&gs_lcp=CgNpbWcQA1D7uQFY0sYBYNbJAWgAcAB4AIABWIgBmwWSAQIxMpgBAKABAaoBC2d3cy13aXotaW1nwAEB&sclient=img&ei=FodLYPjICoKygwfF54OgBQ&bih=824&biw=1280&safe=strict https://www.google.com/search?q=colour+schems+interactive+multimedia+product&tbm=isch&ved=2ahUKEwie0Ya9h6vvAhXC1uAKHX8RBWEQ2-cCegQIABAA&oq=colour+schems+interactive+multimedia+product&gs_lcp=CgNpbWcQA1D_aFi3dmDheWgAcAB4AIABSIgB1AWSAQIxM5gBAKABAaoBC2d3cy13aXotaW1nwAEB&sclient=img&ei=MYdLYN70GMKtgwf_opSIBg&bih=824&biw=1280&safe=strict	

Sourcing, creating, re-purposing and storing assets Creating the structure of interactive multimedia products	Search for assets from the internet using suitable descriptions and search criteria. Record all of your sources into a asset table (create in new asset table specifically for the purpose of your IMP you are going to create. Use the same column headers from asset tables created during class work). Study and make notes about the importance of asset file size and or asset image size to ensure that any assets found have sufficient pixels to be fit for purpose in a final product. Experiment with your assets you have sourced, by repurposing them for a given brief.	Exemplar: https://charlton.uk.com/media/8440/r087-creating-a-interactive-multimedia-product-mia-davies.pdf https://www.google.com/search?q=asset+table+interactive+multimedia+product&tbm=isch&ved=2ahUKEwiu7IzFh6vvAhWM34UKHTdeDGMQ2-cCegQIABAA&oq=asset+table+interactive+multimedia+product&gs_lcp=CgNpbWcQAzoICAAQBxAFEB5Q_PABWKX8AWC5_wFoAHAAeACAAVuIAakFkgECMTGYAQCgAQGqAQtnd3Mtd2l6LWltZ8ABAQ&sclient=img&ei=QodLYK7DEYy_lwS3vLGYBg&bih=824&biw=1280&safe=strict https://www.google.com/search?q=table+of+assets&safe=strict&hl=en-US&source=lnms&tbm=isch&sa=X&ved=2ahUKEwiJhu_gh6vvAhVPPcAKHd5cBsoQ_AUoAXoECBQQAw&biw=1280&bih=824	

Computing

Topic: Principles of Computer Science (Topics 2, 3, 4 and 5)

Aims:

- Pupils will develop an understanding of binary, data representation, data storage and compression.
- Pupils will develop an understanding of hardware and software components of computer systems and characteristics of programming languages
- Pupils will develop an understanding of computer networks and network security.
- Pupils will develop an awareness of emerging trends in computing technologies, and the impact of computing on individuals, society and the environment, including ethical, legal and ownership issues.

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
● Stored program concept	● Define what is meant by the 'stored program concept'. ● Describe the hardware components used in the von Neumann architecture and explain their role in the fetch-decode-execute cycle.	https://youtu.be/SbqXqQ-2ixs?list=PL04uZ7242_M7105DQI8OfbqivqoRkhVYM https://www.bbc.co.uk/bitesize/guides/zkrr97h/revision/1 https://classroom.thenational.academy/lessons/introduction-to-the-cpu-6hhkjd	
● Fetch-decode-execute 1	● Draw and label a diagram of the inside of a computer; label each hardware component and briefly describe its role. ● Explain how the speed of the clock impacts on performance. ● Explain how pipelining improves the performance of the CPU.	https://youtu.be/SbqXqQ-2ixs?list=PL04uZ7242_M7105DQI8OfbqivqoRkhVYM https://www.youtube.com/watch?v=Z5JC9Ve1sfI&t=161s https://www.bbc.co.uk/bitesize/guides/zkrr97h/revision/1 https://classroom.thenational.academy/lessons/the-fde-cycle-68w3ct	
● Fetch-decode-execute	● Explain the relationship between the width of the address bus and the number of memory locations that can be addressed.	https://youtu.be/SbqXqQ-2ixs?list=PL04uZ7242_M7105DQI8OfbqivqoRkhVYM	

2	• Calculate the number of addressable memory locations provided by an address bus of a specified width.	https://www.youtube.com/watch?v=Z5JC9Ve1sfI&t=161s https://www.bbc.co.uk/bitesize/guides/zkrr97h/revision1 https://classroom.thenational.academy/lessons/the-fde-cycle-68w3ct	
• Secondary storage 1	• Explain why secondary storage is needed. • Describe how data are stored on magnetic, optical and solid-state media.	https://www.youtube.com/watch?v=_0KIfGxp37E&list=PL04uZ7242_M7105DQI8OfbqivqoRkhVYM&index=27 https://www.bbc.co.uk/bitesize/guides/zhmmtv4/revision/1 https://classroom.thenational.academy/lessons/secondary-storage-6cv3jt https://classroom.thenational.academy/lessons/optical-and-magnetic-storage-6ww66d	
• Secondary storage 2	• Compare the capacity, speed and portability of magnetic, optical and solid-state storage devices. • Select an appropriate type of storage for a particular purpose. • Construct an expression to calculate data storage requirements.	https://www.youtube.com/watch?v=_0KIfGxp37E&list=PL04uZ7242_M7105DQI8OfbqivqoRkhVYM&index=27 https://www.bbc.co.uk/bitesize/guides/zhmmtv4/revision/1 https://classroom.thenational.academy/lessons/selecting-a-storage-device-74v64c	
• Operating system	• Describe the role of the operating system in a computer system. • Identify tasks carried out by an OS.	https://www.youtube.com/watch?v=7vbRGDgHukA&list=PL04uZ7242_M7105DQI8OfbqivqoRkhVYM&index=32&t=108s https://www.bbc.co.uk/bitesize/guides/zkrr97h/revision/1 https://classroom.thenational.academy/lessons/computer-systems-and-system-software-cmuk4r	
• OS: File manage	• Describe how the OS organises files and allocates space on a hard drive.	https://www.youtube.com/watch?v=7vbRGDgHukA&list=PL04uZ7242_M7105DQI8OfbqivqoRkhVYM&index=32&t=1	

ment	● Construct an expression to calculate the number of blocks of space on a hard drive needed to store a file of a given size. ● Describe how file permissions are used to control access to files. ● Select an appropriate level of file access (read, write, delete, none) for a user.	08s https://www.bbc.co.uk/bitesize/guides/zkrr97h/revision/1 https://classroom.thenational.academy/lessons/computer-systems-and-system-software-cmuk4r	
● OS: Process management	● Describe how an OS uses scheduling to give each active process a share of CPU time. ● Describe the features of the round-robin scheduling algorithm. ● Describe how the OS uses a paging algorithm to swap programs in and out of main memory.	https://www.youtube.com/watch?v=7vbRGDgHukA&list=PL04uZ7242_M7105DQI8OfbqivqoRkhVYM&index=32&t=108s https://www.bbc.co.uk/bitesize/guides/zkrr97h/revision/1 https://classroom.thenational.academy/lessons/computer-systems-and-system-software-cmuk4r	
● OS: Peripheral &user management	● Define what is meant by the term ‘peripheral’. ● Describe how the OS uses drivers to communicate with and manage peripherals. ● Explain the purpose of a user interface and describe features of a user interface. ● Define what is meant by the term ‘access control’. ● Describe commonly used methods of authentication. ● Select suitable access right for specified individuals.	https://www.youtube.com/watch?v=7vbRGDgHukA&list=PL04uZ7242_M7105DQI8OfbqivqoRkhVYM&index=32&t=108s https://www.bbc.co.uk/bitesize/guides/zkrr97h/revision/1 https://classroom.thenational.academy/lessons/computer-systems-and-system-software-cmuk4r	
● Utility software	● Define what is meant by the term ‘utility software’. ● Identify different types of utility software. ● Describe the purpose of: file repair/recovery software, backup/recovery software, file compression software and disk defragmentation software. ● Select which utility software tool to use for a particular task.	https://www.youtube.com/watch?v=Z0uVNcNKags&list=PL04uZ7242_M7105DQI8OfbqivqoRkhVYM&index=33 https://www.bbc.co.uk/bitesize/guides/zkrr97h/revision/1	
● Malware & anti-malware	● Define what is meant by the term ‘cyberattack’. ● Describe the financial, reputational and legal damage that a cyberattack can cause. ● Describe the characteristics of and threat posed by different types of malware. ● Describe how anti-malware works. ● Explain why it is important to keep anti-malware up-to-date.	https://www.bbc.co.uk/bitesize/guides/z6226yc/revision/1 https://classroom.thenational.academy/lessons/the-cost-of-cybercrime-6gvkcr https://classroom.thenational.academy/lessons/automated-cybercrime-6xh64c	

		https://teachers.thenational.academy/lessons/network-defence-70wkce	
● Hackers	● Define what is meant by the term 'hacker'. ● Explain why unpatched software is a target for hackers. ● Explain the function of a firewall. ● Explain how ethical hacking and penetration testing help identify vulnerabilities.	https://www.youtube.com/watch?v=KO9PPmCxEKQ&list=PL04uZ7242_M7105DQI8OfbqivqoRkhVYM&index=46 https://www.bbc.co.uk/bitesize/guides/z6226yc/revision/1 https://classroom.thenational.academy/lessons/where-is-the-danger-cmr3ad	
● Social engineering	● Define what is meant by the term 'social engineering'. ● Describe commonly used social engineering tactics (phishing, pretexting, baiting, quid pro quo) used by hackers. ● Explain the purpose of an acceptable use policy and what it typically includes.	https://www.bbc.co.uk/bitesize/guides/z6226yc/revision/1 https://classroom.thenational.academy/lessons/non-automated-cybercrime-ctk3gc	
● Data level protection	● Explain how data are protected by encryption. ● Describe how backup and recovery procedures protect against data loss. ● Explain how access control helps to protect systems and data.	https://www.bbc.co.uk/bitesize/guides/z6226yc/revision/1 https://classroom.thenational.academy/lessons/fighting-fire-with-fire-c8r3ce	
● Robust software	● Define what is meant by the term 'robust software'. ● Explain how a hacker can exploit a code vulnerability. ● Describe examples of bad coding practices and secure coding practices. ● Explain how code reviews and audit trails help to identify vulnerabilities.	https://www.bbc.co.uk/bitesize/guides/z6226yc/revision/1 https://classroom.thenational.academy/lessons/network-defence-70wkce https://teachers.thenational.academy/lessons/fighting-fire-with-fire-c8r3ce	

Business Studies

Topic: 1.2 Spotting a business opportunity

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
Spotting a Business Opportunity The Competitive environment	Understanding the competitive environment: ● Strengths and weaknesses of competitors based on: price, quality, location, product range and customer service. ● The impact of competition on business decision making.	Must login into GC > then click the below Seneca link using the class code: e4wfdd5mft https://app.senecalearning.com/dashboard/class/e4wfdd5mft/assignments/assignment/eb856baa-b4db-4165-bab2-8c010d57b7e0 https://www.youtube.com/watch?v=pzwwpurAHR0&list=PLf6kR48ysSvM9SU_kqjpsrQo082uWiWcD&index=9	
Spotting a Business Opportunity 1.2.5 Primary & Secondary Market Research	Primary and secondary market research ● Understand the differences and know what the various types are ● What are the uses ● Why are they used ● How are they used ● How to interpret these market researches	Must login into GC > then click the below Seneca link using the class code: e4wfdd5mft https://app.senecalearning.com/dashboard/class/e4wfdd5mft/assignments/assignment/0e2487e7-6fd0-4685-8318-1338ccb718e8 https://www.youtube.com/watch?v=S_-bLwHwcoU&list=PLf6kR48ysSvM9SU_kqjpsrQo082uWiWcD&index=3	
Spotting a Business Opportunity Topic End tests	Checking knowledge, identify areas of weakness and/or learning gaps. To apply additional learning, support and testing in these areas as well as make revision notes for exams.	Must login into GC > then click the below Seneca link using the class code: e4wfdd5mft https://app.senecalearning.com/dashboard/class/e4wfdd5mft/assignments/assignment/921f5415-f00b-46c0-b12b-98aa44f1eb7d	

Topic: 1.3 Putting a business idea into practice

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
Putting a Business Idea into Practice Business Aims & Objectives	What business aims and business objectives are. Business aims and objectives when starting up: ● Financial aims and objectives: survival, profit, sales, market share, financial security ● Non-financial aims and objectives: social objectives, personal satisfaction, challenge, independence and control Why business aims and objectives differ between businesses.	Must login into GC > then click the below Seneca link using the class code: e4wfdd5mft https://app.senecalearning.com/dashboard/class/e4wfdd5mft/assignments/assignment/a47cdf51-3843-4e2a-b704-e8ab6509995f https://www.youtube.com/watch?v=iNtxU2b1cBI&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc	
Putting a Business Idea into Practice Business Revenues & Costs	The concept and calculation of: ● Revenue ● Fixed and variable costs ● Total costs ● Profit and loss ● Interest Interpretation of break-even diagrams: ● The impact of changes in revenue and costs ● Break-even level of output ● Margin of safety Profit and loss	Must login into GC > then click the below Seneca link using the class code: e4wfdd5mft https://app.senecalearning.com/dashboard/class/e4wfdd5mft/assignments/assignment/d1a9474d-c999-4602-b3c7-295d362284f1 https://www.youtube.com/watch?v=FGyRVAC8D_4&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=5 https://www.youtube.com/watch?v=G_vVvmz7WX8&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=2 https://www.youtube.com/watch?v=6akbg2HTn5I&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=4 https://www.youtube.com/watch?v=0uZM-	

		lomXrU&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=26	
Putting a Business Idea into Practice Business Profits & Break-Even Analysis	Sources of finance for a start-up or established small business: ● Short-term sources: overdraft and trade credit Long-term sources: personal savings, venture capital, share capital, loans, retained profit and crowd funding	Must login into GC > then click the below Seneca link using the class code: e4wfdd5mft https://app.senecalearning.com/dashboard/class/e4wfdd5mft/assignments/assignment/b5d75766-5320-44ed-8efc-abc93f8fb70b https://www.youtube.com/watch?v=NerJjmr9BYw&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=3 https://www.youtube.com/watch?v=j-TZlKZG6kk&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=27	
Putting a Business Idea into Practice Cash & Cash Flow 1 & 2	The importance of cash to a business: ● To pay suppliers, overheads and employees. ● To prevent business failure (insolvency). ● The difference between cash and profit. Calculation and interpretation of cash-flow forecasts: ● Cash inflows ● Cash outflows ● Net cash-flow Opening and closing balances	Must login into GC > then click the below Seneca link using the class code: e4wfdd5mft https://app.senecalearning.com/dashboard/class/e4wfdd5mft/assignments/assignment/7eafad49-6b80-4c15-b8b3-c3368108b9b1 https://www.youtube.com/watch?v=7nL4KSl6Fk8&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=10 https://www.youtube.com/watch?v=UmJ9dOF4vHQ&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=11 https://www.youtube.com/watch?v=hif6NwAcxPI&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=12 https://www.youtube.com/watch?v=IUabfq67qd0&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=13	

		https://www.youtube.com/watch?v=i6-HgNp1t_Y&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=14 https://www.youtube.com/watch?v=3EIF1YTxr58&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=15	
Putting a Business Idea into Practice Sources of Business Finance	Sources of finance for a start-up or established small business: ● Short-term sources: overdraft and trade credit Long-term sources: personal savings, venture capital, share capital, loans, retained profit and crowd funding	Must login into GC > then click the below Seneca link using the class code: e4wfdd5mft https://app.senecalearning.com/dashboard/class/e4wfdd5mft/assignments/assignment/55d6ba5c-54be-48c9-9889-24f983a723ab https://www.youtube.com/watch?v=B2TcA1scrKI&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=16 https://www.youtube.com/watch?v=i760YLhlV0Q&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=17 https://www.youtube.com/watch?v=PjFd3JUc2x4&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=18 https://www.youtube.com/watch?v=Eg5RWg7YKbU&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=19 https://www.youtube.com/watch?v=beThQCNWOnk&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=20 https://www.youtube.com/watch?v=mwqM2lcPj0M&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=21 https://www.youtube.com/watch?v=N1hPIZDOkFY&list=PLf6kR48ysSvPl5ublRQK2o7tGeMVeA5Mc&index=22	

Putting a Business Idea into Practice Topic End Tests	Checking knowledge, identify areas of weakness and/or learning gaps. To apply additional learning, support and testing in these areas as well as make revision notes for exams.	Must login into GC > then click the below Seneca link using the class code: e4wfdd5mft https://app.senecalearning.com/dashboard/class/e4wfdd5mft/assignments/assignment/7cf7c502-ce20-402f-aadc-13e35715d931	

Topic: 1.4 Making The Business Effective

Key learning	Detailed Information (I can explain the following points…)	Link to online resource	Studied
Making the business effective The options for start-up and small businesses & Limited Liability	The concept of limited liability: ● Limited and unlimited liability. The implications for the business owner(s) of limited and unlimited liability. The types of business ownership for start-ups: ● Sole trader, partnership, private limited company. ● The advantages and disadvantages of each type of business ownership. The option of starting up and running a franchise operation: The advantages and disadvantages of franchising.	Must login into GC > then click the below Seneca link using the class code: e4wfdd5mft https://app.senecalearning.com/dashboard/class/e4wfdd5mft/assignments/assignment/35daa959-a425-48ba-8441-709a149e688b https://www.youtube.com/watch?v=FlaP0wrtjUA&list=PLf6kR48ysSvPntPzeK3eAktmBgiKR9Yxt	

My Weekly Study Timetable

Date	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday