The Winchester School

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Subject	Focus	Activities	Useful website
Accounting	• To interpret the meaning and features of consignment accounts. • To analyze why consignment is not a sale and explain the important terms used in consignment accounts. • To interpret the use and importance of financial appraisal techniques in the investment decision-making process • To make recommendations as to how the performance of a business, as revealed by a business could be improved.	• Prepare a Prezi presentation comprising the following – ➤ Interpretation of the meaning and features of consignment accounts. ➤ Reasons explaining why consignment is not a sale. ➤ Explain the terms used in consignment accounts. • Present a report on the usefulness of financial appraisal techniques in investment decisions. OR • Prepare a Ted Ed Flipped Lesson on the topic	www.myaccountinglab.com, www.bized.co.uk www.cie.org.uk, http://www.accounting-world.com/ https://www.investopedia.com/ https://study.com/search/text/academy.html?q=accounting#/topresults/accounting
Biology	**Genetic technology:** • To explain that genetic engineering is the deliberate manipulation of genetic material to modify specific characteristics of an organism.	• Schematically illustrate the steps involved in genetic engineering. • Create flash cards on importance of various enzymes and their sources used in gene tranfer.	https://www.youtube.com/watch?v=R0UTROqFC8Q

	- To explain the roles of restriction endonucleases, DNA ligase, plasmids, DNA polymerase and reverse transcriptase in the transfer of a gene into an organism. - To explain why a promoter may have to be transferred into an organism as well as the desired gene. - To explain how gene expression may be confirmed by the use of marker genes coding for fluorescent products. - To explain that gene editing is a form of genetic engineering involving the insertion, deletion or replacement of DNA at specific sites in the genome. - To describe and explain the steps involved in the polymerase chain reaction (PCR). - To describe and explain how gel electrophoresis is used to	- Research in the databases that provide information about nucleotide sequences of genes and genomes, and amino acid sequences of proteins and protein structures. - Diagrammatically explain the process of PCR and highlight its significance. - Create a presentation on the process of gel electrophoresis and its significance along with microarrays in Biology.	https://www.youtube.com/watch?v=9fl4dcgE5EQ https://www.youtube.com/watch?v=B3Pn8cgReug https://www.youtube.com/watch?v=9RIjrdaOUUc https://www.youtube.com/watch?v=Rd-ypr9c6Ok

	separate DNA fragments of different lengths. • To outline how microarrays are used in the analysis of genomes and in detecting mRNA in studies of gene expression.		https://www.youtube.com/watch?v=mN5IvS96wNk
Business Studies	Topic – Finance and accounting strategy • To assess the impact of accounting data and ratio analysis on business strategy.	• Learners to select a large business in UAE and calculate various ratios from the financial statements. Each learner should prepare a presentation and suggest strategies to improve profitability, liquidity, gearing, investment, and financial efficiency ratios.	www.bized.co.uk www.tutor2u.net

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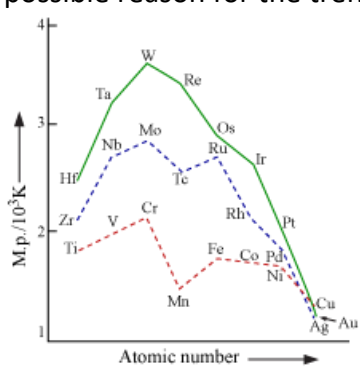| Chemistry	**Electrochemistry:**		
	- To explain the mathematical relationship F = Le - To outline the working of Standard Hydrogen Electrode - To determine the EMF of the electrochemical cell (one half cell being metal/metal ion cell, non-metal/non-metal ion cell, ion/ion cell and the other half cell as SHE) - To outline the direction of redox reaction using the electrochemical cell value - To apply the Nernst equation to predict quantitatively how the value of an electrode potential varies with the concentration of the aqueous ion. - To outline the direction of redox reaction using the electrochemical cell value - To understand and use the equation $\Delta G^{\ominus} = -nE^{\ominus}_{cell}F$	- Solve at least five questions making use of F = Le to predict the identity of a product during electrolysis - Construct electrochemical cell using Standard Hydrogen Electrode as one of the half cell - Research and prepare a write-up on determining the feasibility of a reaction based upon the electrochemical cell value - Plan an investigation to be conducted in a school laboratory to determine the cell potential under non-standard conditions (use Nernst equation) - Prepare a Power-Point presentation on electrochemical cell value and feasibility of a reaction - Practice interrelating standard Gibbs free change with the electrochemical cell value	- https://www.chemguide.co.uk/inorganic/electrolysis/basiccalcs.html - https://byjus.com/chemistry/standard-hydrogen-electrode/ - http://www.dynamicscience.com.au/tester/solutions1/chemistry/redox/electrochemicalcellfromequan.htm - https://chem.libretexts.org/Bookshelves/Introductory_Chemistry/Book%3A_Introductory_Chemistry_(CK-12)/23%3A_Electrochemistry/23.06%3A_Calculating_Standard_Cell_Potentials - https://www.chem.tamu.edu/class/fyp/stone/tutorialnotefiles/electro/nernst.htm - http://www.docbrown.info/page01/ExIndChem/electrochemistry11.htm - https://xtremepapers.xyz/revision/a-level/chemistry/inorganic/transition/features.php

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	Transition elements:		
	Transition elements: • Explain the properties of transition metals. Also, compare properties with s block elements. • describe and explain the reactions of transition elements with ligands to form complexes, including the complexes of copper(II) and cobalt(II) ions with water and ammonia molecules and hydroxide and chloride ions • Describe the shapes of transition metal complexes. • explain qualitatively that ligand exchange may occur, including the complexes of copper(II) ions with water and ammonia molecules and hydroxide and chloride ions • explain the origin of colour in transition element complexes resulting from the absorption of light energy as an electron moves between two non-	• Practice writing electronic configuration of transition elements and ions. • Explore the shapes of d subshell. • Analyse the graph and suggest possible reason for the trends. 	• https://chem.libretexts.org/Textbook_Maps/General_Chemistry/Map%3A_General_Chemistry_(Petrucci_et_al.)/23%3A_The_Transition_Elements/23.1%3A_General_Properties_of_Transition_Metals • http://www.docbrown.info/page07/ASA2ptable2.htm • https://www.memrise.com/course/161010/ocr-chemistry-a2-f325-definitions/3/ • https://revisionworld.com/a2-level-level-revision/chemistry/periodic-table/transition-metals • http://chemed.chem.purdue.edu/genchem/topicreview/bp/ch12/complex.php

- degenerate d orbitals using non degenerate concepts.
- Describe, in qualitative terms, the effects of different ligands on absorption, and hence colour, using the complexes of copper(II) ions with water and ammonia molecules and hydroxide and chloride ions as ligands
- Describe and explain ligand exchanges in terms of competing equilibria
- Deduce expressions for the stability constant of a ligand substitution using Kstab and explain its importance.
- Explain ligand exchange in terms of stability constants, Kstab, and understand that a large Kstab is due to the formation of a stable complex ion

- Research about ligands, prepare a flow chart to show various types of ligands. Understand the differences between coordination number and valency.

Unidentate Ligand	Complex	Shape & Bond Angle	Coordination Number
Water	$[Cu(H_2O)_6]^{2+}$	Octahedral 90	6
Ammonia	$[Co(NH_3)_4(H_2O)_2]^{2+}$	Octahedral 90	6
Chloride ion	$[Cu(Cl)_4]^{2-}$	Tetrahedral 109.5	4
Ammonia/Chloride	$[Pt(NH_3)_2(Cl)_2]$	Square Planar 90	4
Cyanide⁻	$[Cu(CN)_4]^{2-}$	Tetrahedral 109.5	4
Cyanide, CN⁻	$[Ni(CN)_4]^{2-}$	Square Planar 90	4

Examples of Bidentate Ligands
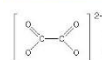
Ethanedioate (oxalate) $C_2O_4^{2-}$

Ethanedioate is able to form **2 coordinate bonds** with the metal ion by donating 2 lone pairs of electrons (from oxygen atoms).
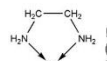
1,2-diaminoethane (ethylenediamine) $NH_2CH_2CH_2NH_2$

Etylenediamine is able to form **2 coordinate bonds** with the metal ion by donating 2 lone pairs of electrons (form nitrogen atoms).

		• Practice writing the equations of transition metals complexes with various ligands and suggest observable changes. Write an expression for *Kstab*	
Economics	• To develop independent learning and research skills using the Flipped classroom method on Ed Puzzle	Complete the following tasks. You could work in groups: • Flipped Learning on the Topic of Nationalization vs privatization • Please go through the resources and complete the following tasks Task 1: Based on the videos and the attached files discuss the arguments for and against Privatization vs Nationalization. • **Task 2:** Research examples of industries that have been privatised over the last 15 years. Find evidence to determine whether the change of ownership has been	www.campaignlive.co.uk/article/1101605/visitengland-funding-domestic-tourism-promotion# • www.orlandosentinel.com/news/politics/os-visit-florida-spending-tourism-20160326-story.html • www.visitflorida.com/en-us/about-visit-florida.html • www.floridatrend.com/article/14761/visit-florida--reinvented

		successful or not. Examine the reasons.	
Pure Mathematics	• formulate a simple statement involving a rate of change as a differential equation • find by integration a general form of solution for a first order differential equation in which the variables are separable • Use an initial condition to find a particular solution interpret the solution of a differential equation in the context of a problem being modelled by the equation.	Research on the application of Integration in Architecture: An Architect Engineer uses integration in determining the amount of the necessary materials to construct curved shape constructions. Application in Medical Science: Biologists use differential calculus to determine the exact rate of growth in a bacterial culture when different variables such as temperature and food source are changed. Application in Graphics: It is used to determine the rate of a chemical reaction and to determine some necessary information of Radioactive decay reaction.	https://mathswithdavid.com/9709-p3-differential-equations/ **https://igcsemathsin.files.wordpress.com/2018/04/p3-differential-equations-revision.pdf** **https://igcsemaths.in/2021/02/25/a-level-mathematics-9709-differential-equations/** **https://drive.google.com/file/d/19qezr-b1WTjotc40qC7ePEh_-Ki-XJvW/view**
Applied Mathematics Mechanics – Work energy Power	• Understand the concept of the work done by a force, and calculate the work done by a constant force when its point of application undergoes a displacement not necessarily parallel to the force	Research on the real life applications of energy and power Energy use and economic development are inseparable. Where there is energy poverty, there is poverty. And where energy availability rises, living standards rise as well. Energy is essential for human progress. Economic expansion and improving access to	https://mathswithdavid.com/9709-mechanics-1-power/ https://www.examsolutions.net/tutorials/exam-questions-work-energy-and-power/?board=OCR&level=A-Level&module=Further+Mechanics+A-Level&topic=11118

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	• Understand the concepts of gravitational potential energy and kinetic energy, and use appropriate formulae • Understand and use the relationship between the change in energy of a system and the work done by the external forces, and use in appropriate cases the principle of conservation of energy	energy enable people to lead longer, more productive lives. Policy. Technology. Consumer preferences. All three affect how the world uses energy. Each driver influences the others and changes over time, with variances by region and political circumstances.	**https://revisionmaths.com/advanced-level-maths-revision/mechanics/work-energy-power** **https://www.physicsandmathstutor.com/pdf-pages/?pdf=https%3A%2F%2Fpmt.physicsandmathstutor.com%2Fdownload%2FPhysics%2FA-level%2FTopic-Qs%2FCAIE%2F05-Work-Energy-Power%2FSet-H%2FWork-Energy.pdf**
Statistics 2	**Hypothesis Tests** • Understand the difference between one-tailed and two-tailed tests and the terms null hypothesis, alternative hypothesis, significance level, rejection region. • Formulate hypothesis and carry out a hypothesis test in the context of single observation from a population which has a binomial or poisson distribution. • Calculate the probabilities of making type I and Type II error.	Research and summaries findings with examples on real life application on hypothesis testing. Make notes to summarize learning that includes formulae and solved examples.	https://stattrek.com/hypothesis-test/hypothesis-testing.aspx https://www.statisticssolutions.com/hypothesis-testing/ https://www.khanacademy.org/math/statistics-probability/significance-tests-one-sample/more-significance-testing-videos/v/hypothesis-testing-and-p-values

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Physics	**Characteristics of alternating currents** Candidates should be able to: 1 understand and use the terms period, frequency and peak value as applied to an alternating current or voltage 2 use equations of the form $x = x_0 \sin \omega t$ representing a sinusoidally alternating current or voltage 3 recall and use the fact that the mean power in a resistive load is half the maximum power for a sinusoidal alternating current 4 distinguish between root-mean-square (r.m.s.) and peak values and recall and use I r.m.s. = I_0 / 2 and	**Alternating currents** An understanding of the practical and economic advantages of transmission of power by electricity from Cambridge IGCSE / O Level Physics or equivalent is assumed.	https://znotes.org/caie/a2-level/physics-9702/theory/alternating-currents/ https://www.savemyexams.com/a-level/physics/cie/22/revision-notes/21-alternating-currents/21-1-properties-and-uses-of-alternating-current/21-1-1-alternating-current--voltage/

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	• *V*r.m.s. = *V*0 / 2 for a sinusoidal alternating current		
Psychology	Obsessive- compulsive disorder (OCD) Students can describe and explain the diagnostic criteria for OCD and describe, explain and evaluate various tools used to measure OCD and can describe, explain and evaluate case studies of OCD.	Students can watch Extreme OCD Camp Episode 2 of the 2013 BBC Three Documentary Trekking into the American forest to manage treatment resistant OCD available at www.youtube.com/watch?v=ywMs MjGF_nw and write a summary about the OCD	www.youtube.com/watch?v=KOami82xKec. www.youtube.com/watch?v=yxXx4Yz62vE
English Language	• To compare and contrast article writing elements and development of ideas.	Analyse the two articles and write a passage stating the differences and comparisons seen in the treatment of disabled people.	https://www.nationalgeographic.com/culture/article/paid-content-technology-is-opening-doors-for-southeast-asias-disabled https://www.cnbc.com/2021/10/29/people-with-disabilities-still-face-barriers-finding-work-during-the-pandemicheres-how-companies-can-help.html

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Art and Design	AO3 and AO4 • Investigated theme, idea, concept or process that is personal to them. • Independent personal study.	The refinement and development of ideas and personal outcomes. To engage in original experimentation with a range of media, materials and techniques, including wet and dry mediums. To investigate critical reflection in the process that helps artists and designers to learn what works and what doesn't.	www.studentartguide.com https://www.smashingmagazine.com/2023/07/critical-reflection-individual-contributors/
Arabic (Arabs)	TOPIC: • قصيدة: حلل الربيع - ابن وكيع التنيسي • قصة: زعتر وزنجبيل • مقال: الدول بين الابتكار والاندثار • نحو: أسلوب الاختصاص **Learning objectives:** • أن ينشر الطالب الأبيات نثرًا أدبيًا • أن يدلل على عاطفة الشاعر في الأبيات • أن يستخرج مظاهر البلاغة من الأبيات • أن يحلل خط تصاعد الأحداث • أن يضع نهاية مختلفة للقصة • أن يميز ملامح الشخصيات في القصة	• أن ينشر الطالب الأبيات نثرًا أدبيًا • أن يدلل على عاطفة الشاعر في الأبيات • أن يستخرج مظاهر البلاغة من الأبيات • أن يحلل خط تصاعد الأحداث • أن يضع نهاية مختلفة للقصة • أن يميز ملامح الشخصيات في القصة • أن يقارن قصة زعتر وزنجبيل بقصة مصباح الحمام • أن يدلل على رأي الكاتب في المقال • أن ينقد الأدلة التي ساقها الكاتب في المقال • أن يضيف أدلة جديدة من إبداعه للمقال • أن يقارن بين مقال دراسته ومقال آخر • أن يعرب أسلوب الاختصاص إعرابًا صحيحًا	https://www.youtube.com/watch?v=QFukrQ8ilro https://www.youtube.com/watch?v=fE9FXhkSBxU https://www.youtube.com/watch?v=qvTL7gb0s_k https://www.youtube.com/watch?v=1Y7Mvb5_kP4

	• أن يقارن قصة زعتر وزنجبيل بقصة مصباح الحمام • أن يدلل على رأي الكاتب في المقال • أن ينقد الأدلة التي ساقها الكاتب في المقال • أن يضيف أدلة جديدة من إبداعه للمقال • أن يقارن بين مقال دراسته ومقال آخر • أن يعرب أسلوب الاختصاص إعرابًا صحيحًا		
Islamic Education (Arabs)	**TOPIC:- التسامح مع المخالفين في العقيدة- آداب الإسلام في الرؤى والأحلام** **Learning objectives:** **يبين موقف الإسلام من اختلاف الناس في العقيدة** **يوضح مظاهر تسامح الإسلام مع المخالفين في العقيدة** **يشرح المقصود بالرؤى والأحلام** **يفرق بين الرؤيا والحلم**	يستنتج الأسباب التي تؤدي إلى الاختلاف بين أصحاب العقائد المختلفة يشرح أهمية تقبل الآخر والتعايش معهم بروح التسامح يحدد أنواع ما يراه النائم في نومه	https://www.youtube.com/watch?v=Au6eyiqaRVc https://www.youtube.com/watch?v=BAEeqb3eTG4

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		يستنتج آداب الرؤى	
Islamic Education (Non Arabs)	TOPIC: Allah is the light of the heavens and earth **Learning objectives:** **To COMPREHEND THE IMPORTANCE OF LIGHT OF FAITH IN HEART** **-TO ANALYZE THE BELIEVER'S DUTY TOWARDS THE HOUSE (MASJID) OF ALLAH** TOPIC: OBSERVANCE (ITTIBA) AND IMITATION (TAQLEED **Learning objectives:**	How does Faith influence the way people cope with adversity and find strength in difficult times? In what ways does Faith contribute to the development of personal resilience and emotional well-being? If blind imitation is not liked by Allah and Prophet (P.B.U.H) then, Clarify Can we follow the trait that is praised and favorable by Islam. Analyse the reasons of imitating	https://www.youtube.com/watch?v=-G5m5oIoYf4 https://www.youtube.com/watch?v=iQexG_CsKo4

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	-TO COMPREHEND THE CONCEPT OF BLIND IMITATION TO ANALYZE THE REASONS OF FOLLOWING OTHERS	others blindly and suggest practical solutions to combat this behaviour among Muslim.	
Applied ICT	➢ To recognize the use of Reduced Instruction Set Computers (RISC) and Complex Instruction Set Computers (CISC) processors. ➢ To evaluate the four basic computer architectures and the concept of a virtual machine.	Solve past paper questions based on the given topics . Create a mind map on different stages in a system life cycle Create a video using audacity and Movie maker Use advanced excel functions and relational database concepts Edit images and animate objects using image editing tools	https://www.geeksforgeeks.org/computer-organization-risc-and-cisc/
Computer Science	o Evaluate the benefits and limitations of virtual machines.	➢ To create a mind map to show the differences between RISC and CISC o interrupt handling on CISC and RISC processors	https://www.shiksha.com/online-courses/articles/virtual-machine-advantages-and-disadvanta ges/

		➢ Give examples of the role of virtual machines Evaluate the benefits and limitations of virtual machines	