Year 13 Half Term 3 Curriculum

Subject	Half Term 3 – Topic/Summary of Powerful Knowledge
English Literature	Theory and Independence: • Deepen understanding of feminist theory including noted feminist figures, the development of the movement and the importance of literature to the movement. • Develop understanding of the literary canon including: the conception, history and significance. • Recall and deepening of knowledge of eras in history such as Victoria, Georgian and Post-war America and how this period relates to chosen text. • Recall and deepening of Othello as a tragedy: plot, character, dramatic methods, structure and genre through analysis of extracts. • Deepen understanding of Marxist theory including meaning behind movement, prolific figures and importance of literature in movement. • Deepen understanding of narrative theory including structure, narrative voice and perspective, and gaps in narrative. • Recall and deepening of knowledge of eras in history such as Victorian era and Pre and Post-war America. • Develop an understanding of literary movements such as postmodernism and futurism. • Further develop understanding of plot, character, poetic/authorial methods, structure and genre through analysis of the texts. • Understanding of HOW to integrate critical theory into their own writing: how to cite a critic, how to embed critical opinions into writing, how to formulate a bibliography. *Selected texts from Summer Reading List* *The Critical Anthology (AQA)* Unseen Crime extracts revisited
Maths	Numerical methods • Locating roots • Using iteration to approximate roots to $f(x)$=0 • The Newton-Raphson method Integration • Integration by standard result • Integration by 'reverse chain rule' • Integration by substitution • Integration by parts • Integrating partial fractions • Approximating areas using the trapezium rule • Solving Differential Equations Vectors • Distance between two points. • i,j,k notation for vectors • Magnitude of a 3D vector and using it to find angle between vector and a coordinate axis.

	• Solving geometric problems • Application to mechanics
Science	Biology • Stimuli & response • Organisms increase their chance of survival by responding to changes in their environment. • In flowering plants, specific growth factors move from growing regions to other tissues, where they regulate growth in response to directional stimuli. • The effect of different concentrations of indoleacetic acid (IAA) on cell elongation in the roots and shoots of flowering plants as an explanation of gravitropism and phototropism in flowering plants. • Taxes and kineses as simple responses that can maintain a mobile organism in a favourable environment. • The protective effect of a simple reflex, exemplified by a three-neurone simple reflex. • **Required practical 10:** Investigation into the effect of an environmental variable on the movement of an animal using either a choice chamber or a maze. • a receptor to illustrate that: • receptors respond only to specific stimuli • stimulation of a receptor leads to the establishment of a generator potential. • The basic structure of a Pacinian corpuscle. • Deformation of stretch-mediated sodium ion channels in a Pacinian corpuscle leads to the establishment of a generator potential. • The human retina in sufficient detail to show how differences in sensitivity to light, sensitivity to colour and visual acuity are explained by differences in the optical pigments of rods and cones and the connections rods and cones make in the optic nerve. • subsequent wave of electrical activity. The roles of the sinoatrial node (SAN), atrioventricular node (AVN) and Purkyne tissue in the bundle of His. • The roles and locations of chemoreceptors and pressure receptors and the roles of the autonomic nervous system and effectors in controlling heart rate. The control of gene expression • Gene mutations might arise during DNA replication. They include addition, deletion, substitution, inversion, duplication and translocation of bases. • Gene mutations occur spontaneously. The mutation rate is increased by mutagenic agents. Mutations can result in a different amino acid sequence in the encoded polypeptide. • Some gene mutations change only one triplet code. Due to the degenerate nature of the genetic code, not all such mutations result in a change to the encoded amino acid. • Some gene mutations change the nature of all base triplets downstream from the mutation, ie result in a frame shift. • Totipotent cells can divide and produce any type of body cell.

	• During development, totipotent cells translate only part of their DNA, resulting in cell specialisation. • Totipotent cells occur only for a limited time in early mammalian embryos. • Pluripotent cells are found in embryos; multipotent and unipotent cells are found in mature mammals and can divide to form a limited number of different cell types. • Pluripotent stem cells can divide in unlimited numbers and can be used in treating human disorders. • Unipotent cells, exemplified by the formation of cardiomyocytes. • Induced pluripotent stem cells (iPS cells) can be produced from adult somatic cells using appropriate protein transcription factors. • In eukaryotes, transcription of target genes can be stimulated or inhibited when specific transcriptional factors move from the cytoplasm into the nucleus. The role of the steroid hormone, oestrogen, in initiating transcription. • Epigenetic control of gene expression in eukaryotes. • Epigenetics involves heritable changes in gene function, without changes to the base sequence of DNA. These changes are caused by changes in the environment that inhibit transcription by: • increased methylation of the DNA or • decreased acetylation of associated histones. • The relevance of epigenetics on the development and treatment of disease, especially cancer. • In eukaryotes and some prokaryotes, translation of the mRNA produced from target genes can be inhibited by RNA interference (RNAi). • Chemistry • Polymers • Condensation polymers • Condensation polymers are formed by reactions between: • dicarboxylic acids and diols • dicarboxylic acids and diamines • amino acids. • The repeating units in polyesters (eg Terylene) and polyamides (eg nylon 6,6 and Kevlar) and the linkages between these repeating units. • Typical uses of these polymers. • **Students should be able to:** • draw the repeating unit from monomer structure(s) • draw the repeating unit from a section of the polymer chain • draw the structure(s) of the monomer(s) from a section of the polymer • explain the nature of the intermolecular forces between molecules of condensation polymers. • Biodegradability and disposal of polymers • Polyalkenes are chemically inert and non-biodegradable. • Polyesters and polyamides can be broken down by hydrolysis and are biodegradable. • The advantages and disadvantages of different methods of disposal of polymers, including recycling. • **Students should be able to:**

	• explain why polyesters and polyamides can be hydrolysed but polyalkenes cannot • Amino Acids, Proteins and DNA • Amino acids have both acidic and basic properties, including the formation of zwitterions. • **Students should be able to** draw the structures of amino acids as zwitterions and the ions formed from amino acids: • in acid solution • in alkaline solution. • Proteins are sequences of amino acids joined by peptide links. • The importance of hydrogen bonding and sulfur–sulfur bonds in proteins. • The primary, secondary (α-helix and β–pleated sheets) and tertiary structure of proteins. • Hydrolysis of the peptide link produces the constituent amino acids. • Amino acids can be separated and identified by thin-layer chromatography. • Amino acids can be located on a chromatogram using developing agents such as ninhydrin or ultraviolet light and identified by their R_f values. • **Students should be able to:** • draw the structure of a peptide formed from up to three amino acids • draw the structure of the amino acids formed by hydrolysis of a peptide • identify primary, secondary and tertiary structures in diagrams • explain how these structures are maintained by hydrogen bonding and S–S bonds • calculate R_f values from a chromatogram. • **Enzymes** • Enzymes are proteins. • The action of enzymes as catalysts, including the concept of a stereospecific active site that binds to a substrate molecule. • The principle of a drug acting as an enzyme inhibitor by blocking the active site. • Computers can be used to help design such drugs. • **Students should be able to:** • explain why a stereospecific active site can only bond to one enantiomeric form of a substrate or drug. • DNA • The structures of the phosphate ion, 2-deoxyribose (a pentose sugar) and the four bases adenine, cytosine, guanine and thymine are given in the Chemistry Data Booklet. • A nucleotide is made up from a phosphate ion bonded to 2-deoxyribose which is in turn bonded to one of the four bases adenine, cytosine, guanine and thymine. • A single strand of DNA (deoxyribonucleic acid) is a polymer of nucleotides linked by covalent bonds between the phosphate group of one nucleotide and the 2-deoxyribose of another nucleotide. This results in a sugar-phosphate-sugar-phosphate polymer chain with bases attached to the sugars in the chain. • DNA exists as two complementary strands arranged in the form of a double helix. • **Students should be able to:**

	• explain how hydrogen bonding between base pairs leads to the two complementary strands of DNA. • Action of anticancer drugs • he Pt(II) complex cisplatin is used as an anticancer drug. • Cisplatin prevents DNA replication in cancer cells by a ligand replacement reaction with DNA in which a bond is formed between platinum and a nitrogen atom on guanine. • Appreciate that society needs to assess the balance between the benefits and the adverse effects of drugs, such as the anticancer drug cisplatin. • **Students should be able to:** • explain why cisplatin prevents DNA replication • explain why such drugs can have adverse effects. Physics • Capacitance • Magnetic fields • Thermal Physics
History	• Native American Civil Rights 1865-1992 • Gilded Age • Progressive Era • WWI • New Deal • Great Depression • WWII • Post War Termination • Red Power 1960's • Progress up to 1992 • Coursework
Art	<u>A-Level - AQA External Exam preparation</u> • Collation of primary and secondary sources. Sketchbook work, development of ideas. • Produce a final personal response • Research chosen topic and relevant artists. Written notes and critical analysis. <u>BTEC - Unit 2 – Sit External Written Exam</u> <u>BTEC - Unit 3 – The Creative Process</u> • Apply stages and activities within the creative process to develop own art and design work
Business	Unit 8: The Recruitment and Selection Process Examine how effective recruitment and selection contribute to business success • Recruitment of staff • Recruitment and selection process • Ethical and legal considerations in the recruitment process
Computing	Analysis of business' use of Social media - students will analyse a series of social media platforms and identify the advantages and disadvantages for both personal and organisational use.

	• Explain the difference between an organisation's use of a platform compared with how a single user may use it • Give examples of how data can be presented to a user Explain why a business would use a specific platform with well thought out reasons justified with examples	
Film Studies	<u>Experimental Film</u> • Production context of Pulp Fiction and Tarantino as Auteur • Postmodernism in film and Pulp Fiction as 'era defining' postmodernist film • Bordwell (1979) on art cinema and experimental use of narrative • Pulp Fiction's narrative structure: episodic, circular and playful • Experimental approaches to cinematography, editing and mise-en-scene *Set text:* *Pulp Fiction (Tarantino, 1994)* <u>Short Film Study and Production</u> • Reviewing sequences and planning for improvement *Set texts:* *15 short films (pupils study a minimum of 3 totalling a minimum of 80 minutes)*	
Games Design	<u>U13 Learner s will produce and check a digital game in a specific genre. They will create game with the authoring software. Develop written or recorded documentation of the checking of the game.</u> • Using the Internet to source and save assets to be used in their game. • Using graphics software to develop user interface, character and objects. • Using a sound engine to develop sound effects.	
Health	Extended Certificate (Single HSC) <u>Meeting individual needs – Unit 5</u> • Challenges (Martin) • Overcoming challenges (Martin) • Roles and responsibilities	Diploma (Double HSC) <u>Meeting individual needs – Unit 5</u> • Challenges (Nusrat) • Overcoming challenges (Nusrat) • Roles and responsibilities <u>Work experience – Unit 6</u> • Goal setting • Importance of planning <u>Principles of safe practice – Unit 7</u> • Comparison of HASAWA and COSHH
Music	<u>Unit 2: Professional Practice in the Music Industry-External Examination</u> A01 • Professional behaviours-being prepared, reliable and committed, being organised, planning using prioritisation skills, communication skills, awareness of others, punctuality, meeting deadlines, scheduling, teamwork, when to take the lead and when to delegate, outcomes and making decisions. • Project planning-gathering information including organisations that commission work – arts agencies, arts bodies, councils, charities,	

	commercial organisations such as record companies, festival organisers, individuals – entrepreneurs and contacts within your network who may commission work. • Short-, medium- and long-term plans including documentation and presentation of plans, schedules, action plans, priorities and lists, being able to set a realistic and achievable project plan for the immediate project, daily scheduling when necessary, action plans for self and others when working as part of a team, planning for other constraints and costs involved in putting on events or releasing product. • Prioritising actions and how priorities are worked out. • Contingency and mitigation including carefully generating contingency plans for outcomes other than that expected, exploring mitigation, solutions and resolutions to identified and unexpected risks. • Creative vision-exploring creative ideas in the context of a bid for work, creative problem solving. • Copyright and the issues surrounding the distribution of media and digital rights management, intellectual property rights, the rights of the copyright owner, licensing, fair dealing and fair usage, duration of copyright, obtaining permissions and how copyright and internet support/conflict each other. • Copyrighting your work-the role of music licensing organisations, PRS for Music. • Formation of a contract-types of contracts – performance contracts, booking contracts, manager contracts, recording contracts, producer and remix contracts, assistance and services supplied by professional unions and trade bodies within the music and entertainment industries. • Insurance-types of insurance – public liability, personal and equipment insurance. • Health and safety regulations/responsibilities of venues, individuals and organisations. • Risk assessment and management. • Set-up of staging and musical equipment, e.g., knowing who sets up and manages equipment and how their safety and wellbeing is ensured; working at heights, equipment and environmental hazards. • Principles of lifting heavy objects. • Electrical safety. • How loudness should be approached and managed. • Lifestyle and pressures that could be damaging to health and wellbeing.
PE	<u>Exam Unit</u> <u>Unit 1 – Body systems and the effects of physical activity</u> • Revision and preparation for exam <u>Exam Unit</u> <u>Unit 3 – Sports organization and development</u> • Revision in preparation for exam <u>Coursework Unit</u>

	<u>Unit 17 - Sports Injuries and Rehabilitation</u> • LO1: Know common sports injuries and their effects • LO2: Be able to minimise the risk of sports injurie
Photography	<u>Personal Project</u> This part of the course the students select a topic for their personal project and produce a body of work that explores their chosen topic.
RE/PSHE	<u>Religion, Peace and Conflict:</u> • Causes of conflict • Different types of conflict • Christian attitudes to war • Why are some Christians pacifists? • What do Muslims believe about war?
Psychology	<u>Unit 3 external exam – 19th January 2023</u> <u>Unit 6 – LA. A</u> Defining psychopathology • Mental health and well-being • Statistical definitions • Biological and psychological approaches • Classification systems – DSM, ICD
Sociology	<u>Crime and Deviance</u> • Crime control, surveillance, prevention and punishment, victims, and the role of the criminal justice system and other agencies. <u>Beliefs in Society</u> • Ideology, science and religion, including both Christian and non-Christian religious traditions • The relationship between social change and social stability, and religious beliefs, practices and organisations <u>Theories and Methods</u> • Social action theories • The concepts of modernity and post-modernity in relation to sociological theory
Hospitality	<u>European Foods</u> • Know the equipment, commodities and methods required to prepare and cook different examples of European food • Know the styles of food and types of dishes that are prepared and cooked in Europe • Be able to demonstrate food preparation and cooking skills that are safe, hygienic and professional when creating European dishes • Be able to evaluate the quality of European dishes.