

Year 12 TERMLY CURRICULUM

English Language

English Language & Literature Combined

Sport Science

Engineering

Term 1

An introduction to the study of language. Students explore the language levels of analysis and the basic contextual factors. They examine what language is and explore some of the issues with language, such as gender, context and dialect forms.

Skills and introduction to language and literature. Language levels. Introduction to Handmaid's Tale and Seamus Heaney

Unit 12 - Nutrition in sport (Term 1 and 2). Students will create a presentation on the importance of a balanced diet where they will investigate the different factors, why they are important and what impact they have on different groups. Students will then develop an understanding of energy balance; an investigation into energy balance, the way in which energy is measured and being able to measure how much energy a person needs from food dependent on their specific needs. This accompanied with an understanding of how much energy is produced in specific food groups and how this effects specific sports will allow the student to submit their extended project that will be submitted as coursework. Unit 1 - Body systems and the effects of physical activity (Term 1-5). Students will understand the skeletal system in relation to exercise and physical activity, specifically types of bone and their function, joints and the effects of physical activity on the body. Students will then develop their knowledge of the muscular system, in particular the different types of muscles functions, types of muscle contraction and the effects of exercise on the muscular system. Students will then move on to the cardiovascular system studying specifically the structure of the heart, blood vessels and blood cells. The final aspect of the course is related to the lungs and energy systems where students will understand the impact of physical activity on all of these.

Theory ContentThe students will focus on: Principles 01 - identifying requirements, Principle 02 - Learning from existing products and practice and Principle 03 - Implications of wider issues.Students will be assessed on theory content and practical project.

Term 2

Students build on the work from last term. They explore the ways spoken language is used and research some of the key theoretical ideas. They start their work on language and diversity looking at gender, disability, occupation and social groups. They explore short data sets and apply that to the theoretical basis.

Mode and spoken language levels. Applying knowledge to Paris texts. Learning of advanced textual analysis skills and the rest of the language levels. Application of language levels to Handmaid's Tale. Chapter study work. Analysis of key Heaney poems with language levels.

Unit 2 - Sport Coaching (Terms 3-5) - Students will investigate the different coaching theories and have the opportunity to research, plan, deliver and review different coaching systems in practical environments. Students will develop an understanding of the different principles that underpin coaching and leading; looking specifically at leadership and personality types. Students will also look at different methods used to improve skills, techniques and tactics. Students will have the opportunity to carry out practical coaching sessions that will hugely benefit them when evidencing their project that will be submitted as coursework.

Theory ContentThe students will focus on: Principles 04 - Design thinking and communication, Principle 05 - Materials and component considerations and Principle 06 - Technical understanding part 1.Students will be assessed on theory content and practical project.

Term 3

The focus this term is on language and representation and students examine a number of different texts by applying the language levels and linking findings to language and representation. They also examine how to link and compare texts.

Advanced work on contextualising Paris texts. Working through Anthology with exam technique. Focus on comparison skills. Handmaid's core on key concepts, genre and exam skills. Context applied in exam context. Heaney, advanced application of language levels and exam technique

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Theory ContentThe students will focus on: Principles 06 - Technical understanding part 2, Principle 06 - Technical understanding part 3 and Principle 07 - Manufacturing processes and techniques.Students will be assessed on theory content and practical project.

Term 4

Students have the chance to examine how text producers shape their language to appeal to particular audiences and purposes. They then explore non-fiction style models and have a go at analysing the characteristics of the genre. Students will then recreate the information into a new text using their own creative styles and methods.

Continuation of analysis of Paris texts. Preparation for mocks. Exam modelling and examiners' insight. Handmaid's and Heaney, advanced concepts applied.

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Theory ContentThe students will focus on: Principles 08 - Viability of Design solution and Principle 09 - Health and Safety.Students will be assessed on theory content and practical project.

Term 5

Students will commence study on the NEA part 1 which is a language investigation on a topic of their own choice. They complete initial secondary research and apply the theory to texts they have collected themselves. The emphasis is on data collection and research design and students will then select their own language methods to analyse the sample. Students also complete a full AS mock exam this term.

Mock and feedback from mock. Start teaching textual recreation and The Kite Runner. Start teaching NEA 'Making Connections' investigation.

NEA ProjectThe students will be starting on their NEA task. This is worth 60% of their overall grade.Students will be assessed on an end of year exam.

Year 12 TERMLY CURRICULUM

Physics

Chemistry

Biology

Applied Science

Term 1

Module 1: Development of practical skills in physics. This module covers planning and evaluating experiments, significant figures, plotting and interpreting graphs. Module 2: Foundations in physics. Covering physical quantities and units, nature of quantities and making measurements. STEAM Skills Focus -Organisation and independent study.

This term will focus on Atoms and their Reactions. We will build upon the GCSE content and deepen students knowledge about the atom by focusing on atomic structure, electron configuration and isotopes. We will then look at acid & alkali chemical reactions and how ion charges change within these reactions. STEAM Skills Focus - Problem-Solving

Module 2: This module explores cell structure; the use of a microscope to observe a range of cell types, the ultrastructure of animal, plant and bacterial cells and comparing eukaryotic and prokaryotic cells. Biological Molecules is also studied; the importance of carbohydrates, lipids and proteins for life. Finally biological membranes; involving the roles of membranes in cells, factors affecting structure and permeability and how molecules move across the membrane. STEAM Skills Focus - interpretive skills, lab skills, drawing skills, analysis and evaluative skills, independent, collaboration skills

In this term we are going to start looking at Unit 1: Fundamentals of Applied Science. We will be exploring the structures of different biological molecules and what their roles are within living organisms. We will also be looking at the fundamentals of the atom arrangement and atomic structure. STEAM Skills Focus - Communication

Term 2

Module 3: Forces and motion: Covering motion graphs, constant acceleration, free fall and acceleration, determining acceleration due to gravity, stopping distances, Newton's laws of motion, turning forces, centre of mass, density, pressure, work, energy, power, materials, deformation and Newton's laws of motion. STEAM Skills Focus - Lab skills and data analysis.

This term will focus on two modules: Electrons, Bonding and Structure and The periodic Table & Energy. During these lessons students will look at how different elements bond together and why there is an attraction that forms between structures. When the look at the periodic table, they will build upon GCSE properties and trends but extend to how properties change across a period. STEAM Skills Focus - Communication

Module 2: The rest of this module covers the role of enzymes and the factors affecting enzyme activity. Nucleotide and nucleic acids follows, with study into the structure of DNA and how DNA replication takes place. Finally cell division, cell diversity and cellular organisation. STEAM Skills Focus - interpretation skills, analysis and evaluation skills, presentation skills, collaborative skills.

In this term we are going to continue our work through Unit 1: Fundamentals of Applied Science. We will be exploring the impact that different ions and their impact on living organisms. We will also be exploring organic chemistry, looking at both their structures and reactions. STEAM Skills Focus - Collaboration

Term 3

Module 4: Electrons, waves and Photons. Covering current, charge, energy, power, resistance. electrical circuits, circuit analysis, potential dividers, series and parallel circuits, STEAM Skills Focus - Adaptability and research skills.

This term we will look at two modules: Rates of Reactions and Core Organic Chemistry. In rates of reaction we will look at multi-step reactions and identify where the speed of the reaction is effected and look at the specific impact chemicals can have on the rate. Core Organic Chemistry is the introduction chapter to carbon based chemistry. We will explore structures of different compounds and how its functional group will dictate properties and reactions. STEAM Skills Focus - Creativity

Module 3: In this module, learners study the structure and function of gas exchange and transport systems in a range of animals and in terrestrial plants. The significance of surface area to volume ratio in determining the need for ventilation, gas exchange and transport systems in multicellular organisms is emphasised. The examples of terrestrial green plants and a range of animal phyla are used to illustrate the principle. Learners are expected to apply knowledge, understanding and other skills developed in this module to new situations and/or to solve related problems. STEAM Skills Focus - evaluation skills, planning skills, teamwork skills, feedback skills, self confidence and self evaluation skills.

In this term we are going to complete Unit 1: Fundamentals of Applied Science and start working on Unit 2 and Unit 6. Unit 2 will focus us applying the fundamentals into practical work. We will become fluent in five different practical techniques and build upon our skills of completing Lab reports. Unit 6 will focus on the legal side of working and developing a lab to ensure everyone is safe within the work environment. STEAM Skills Focus - Problem-Solving, Communication, Critical Thinking

Term 4

Module 4: Electrons, waves and Photons. Covering wave motion, electromagnetic waves, superposition and stationary waves, photons, the photoelectric effect and wave-particle duality. Revision for the AS exam. STEAM Skills Focus - creativity and lab skills.

This term we will finish our Core Organic chemistry modules and move into Core Organic Chemistry 2 module. In this module we will explore alcohols and their reactions to for aldehydes and ketones. We will also explore how organic compounds effect the environment and how we are able to identify industry is able to manufacture and identify specific organic compounds. STEAM Skills Focus - Collaboration

Module 4: In this module the learners study the biodiversity of organisms; how they are classified and the ways in which biodiversity can be measured. It serves as an introduction to ecology, emphasising practical techniques and an appreciation of the need to maintain biodiversity. The learners also gain an understanding of the variety of organisms that are pathogenic and the way in which plants and animals have evolved defences to deal with disease. The impact of the evolution of pathogens on the treatment of disease is also considered. The relationships between organisms are studied, considering variation, evolution and phylogeny. STEAM Skills Focus - evaluating skills, creating conclusions from observations, research skills, comprehension skills.

This term, we will continue working on Unit 2 and Unit 6. Unit 2 will focus us applying the fundamentals into practical work. We will become fluent in five different practical techniques and build upon our skills of completing Lab reports. Unit 6 will focus on the legal side of working and developing a lab to ensure everyone is safe within the work environment. STEAM Skills Focus - Problem-Solving, Communication, Critical Thinking

Term 5

Revision for the AS exam and general reflection of the Y12 course. STEAM Skills Focus - Self reflection.

This term will focus on a series of lessons on each module where structured options are provided allowing a choice in the content and level of work. This allows flexibility in learning to ensure that the needs of all learners is being met. This provides the scaffolding and structured to develop knowledge, understanding and exam technique. This is used to prepare students for completing the AS Exam. Once the exam window is closed, students will start working on deepening their knowledge on Rates of Reaction, specifically looking at how the rate of equilibrium is met. STEAM Skills Focus - Critical Thinking

Module 4: Covering; Classification and evolution. Students will study how evolution has generated a very wide variety of organisms. The fact that all organisms share a common ancestry allows them to be classified. Classification is an attempt to impose a hierarchy on the complex and dynamic variety of life on Earth. Students will also study how classification systems have changed and will continue to change as our knowledge of the biology of organisms develops. Revision and preparation for end of year internal assessments. Starting Module 5; Communication and Homeostasis. Students will understand the importance that organisms, both plants and animals are able to respond to stimuli. This is achieved by communication within the body, which may be chemical and/or electrical. Both systems are covered in detail in this module. Understanding that communication is also fundamental to homeostasis with control of temperature, blood sugar and blood water potential being studied as examples. STEAM Skills Focus - research skills, adaptability, teamwork, leadership.

This term, we will continue working on Unit 2 and Unit 6. Unit 2 will focus us applying the fundamentals into practical work. We will become fluent in five different practical techniques and build upon our skills of completing Lab reports. Unit 6 will focus on the legal side of working and developing a lab to ensure everyone is safe within the work environment. STEAM Skills Focus - Problem-Solving, Communication, Critical Thinking

Year 12 TERMLY CURRICULUM

Computer Science

Creative Digital Media Production

Mathematics

Further Mathematics

Term 1

Systems Architecture and Software - Students revisit Systems Architecture with added detail on the architecture of the CPU. Students gain a detailed insight into the Fetch/Decode and Execute cycle as well as learning about different processor architectures including Von Neumann, Harvard and Complex/Reduced instruction set computers. Students will also develop their understanding of software, including system software (operating systems and utility software). As part of the programming curriculum, students will learn how to create Graphical User Interfaces using the TKinter module in Python.

Introduction to the course: Introduction to media specific terminology, key theorists and analysis skills. Unit 1: Media Representation Topic A: Media messages Students will explore media representations in context and how media products construct representations. They will investigate a range of products including film, TV, advertising, games, music videos and magazines. Students will explore the representations of genre, ethnicity, age, social groups and places. The main theorists covered in term 1 include: • Stuart Hall • Richard Dyer • Laura Mulvey Unit 12/13: Topic A: Students will explore common components of a web page, audience and purpose.

Students will master the essential algebra and number skills needed for the course, including but not limited to simultaneous equations, inequalities, quadratics and surds. They will use these skills to draw quadratic equations and interpret their properties. In Mechanics, they will construct models and work with vectors for the start of their Applied Mathematics course. They will draw and interpret Displacement and Velocity-Time graphs.

Students will multiply matrices and use the determinant to find the inverse of a matrix. Students will also explore imaginary numbers. They will study momentum in one direction and the conservation of momentum. They will then move onto work, energy and power.

Term 2

Compression, Encryption and Hashing and Databases - Students will spend Term 2 learning the theory behind compression, encryption and hashing - including some of the techniques used to implement these tools. Students will also learn the key theoretical database concepts and have an introduction to the SQL language for creating, editing and querying databases. As part of the programming curriculum, students will spend the term putting their database theory into practice through the creation of software which includes SQLite3 databases.

Unit 1: Media Representations Topic B: Understanding Media messages Students will revisit some elements of audience theory and semiotics. Unit 1: Media representations: Topic C: Stylistic codes Students will cover: • Camerawork and photography • Lighting • Editing • Sound • Design Unit 12/13: Topic A: Students will examine accessibility features and interactive content. Unit: 12/13: Topic B: Students will explore sourcing assets. This will include: • Creating graphics – vector shapes, bitmap images, buttons, icons. • Primary sources – writing copy, taking photographs, recording multimedia content. • Secondary sources – libraries, copyright, clearances. • Log all assets – name, size, file format, permissions. • Select assets for a specific audience and purpose. Unit 12/13: Topic C: Students will explore structure and organisation. This will include file management: • root folder structure • file name conventions.

Work will focus on straight-line graphs and equations of circles. Students will be able to find gradients, midpoints and lengths of line segment and use this to find equations of normals & tangents as well as solve geometrical problems involving area. They will also connect their GCSE work on circle theorems to geometric problem involving circles on coordinate axes. In Mechanics, they will study motion in two dimensions, connected particles and pulleys.

Students will study the transformations of matrices and study Argand diagrams. They will study elastic strings and springs studying Hooke's Law and elastic energy.

Term 3

Web Technologies, Application Generation, Software Development and Networks - Students spend much of term 3 learning about the various technologies involved in the creation of software applications, as well as the methodologies used in industry for the successful development of software projects. This provides early and intrinsic practise in preparation for the student's programming projects which will begin in Term 5 on Year 12. Students will further their knowledge of Networks and gain an advanced insight into how computers communicate with each other.

Unit 4: Pre-production portfolio Students will study the requirements of planning and delivering a digital media product, carrying out essential pre-production tasks and creating a pre-production portfolio. This will include: • Requirements for a specific media production • The formats for pre-production processes • The functions of pre-production processes • The purposes of pre-production documentation • Procedures to follow • Pre-production requirements relevant to web production and digital games production Unit 12/13: Topic C: Students will create a page layout, learn how to insert and position assets, explore all areas of navigation and interactivity. Students will also have the opportunity to complete testing in different web browsers They will explore: • Functionality. • Page content displays as intended. • Working links.

Students will be introduced to differentiation and integration, where they will be able to find gradients of non-linear graphs at specific points and use first and second derivatives to find stationary points along with equations of tangents and normals. More work will be done to improve students algebra skills this term including the revisiting of algebraic fractions but then onto the new content involving algebraic long division, factor theorem and remainder theorem. In Mechanics, they will apply differentiation to variable acceleration and begin their statistics course, beginning with data collection.

Students will use the calculus from the A Level course to calculate volumes of revolution around the x and y axes. They will study roots of polynomials for quadratic, cubic and quartic equations. In Mechanics, they will study elastic collisions in 1D and 2D.

Year 12 TERMLY CURRICULUM

Computer Science

Creative Digital Media Production

Mathematics

Further Mathematics

Term 4

Data Types, Data Structures and Algorithms - Students will learn a series of mathematical concepts in Computer Science including binary representations of decimal numbers which are negative or contain a decimal point. Students will also learn a number of Boolean algebra methods to solve problems using Boolean logic. In addition, students will learn the internal architecture and circuitry required for arithmetic to take place within the CPU. Continuing to develop students understanding for both the programming project and Paper 2, students will spend term 4 learning about advanced data structures and algorithms used widely in the computer science industry. Students will learn the data structures for the storage of multiple pieces of data and the relative benefits of each data structure in different scenarios. Students will learn algorithms for sorting/searching data as well as "shortest path" algorithms for calculating the shortest path between two different nodes (as seen in satellite navigation systems and gaming). In addition, students will learn how to measure algorithmic efficiency and speed using Big O Notation. As part of the programming curriculum, students will spend term 4 programming the various data structures and algorithms learned in theoretical lessons. Students will also start preparations for their programming project, including writing their project proposals for review by the exam board.

Unit 4: Pre-production portfolio: Requirements for a specific media production. Students will create a portfolio and manage the pre-production for their own creative media production.

- Produce a pre-production portfolio for a creative media production
- Project management
- Unit 12/13: Topic A: Students will explore different game genres. This will include:
 - Genres of video games.
 - Graphical theme in video games.
 - Game genre features.
 - Role-playing game (RPG)
 - Strategy
 - Sports
 - Adventure
 - Action
 - Simulation
 - Puzzle
 - Hybrid

Students will investigate gameplay design. Unit 12/13: Topic B: Students will explore game level design and focus on sourcing and preparing assets. This will include:

- Selection of genre, purpose and audience.
- Core gameplay mechanics.
- Placement of gameplay elements.
- User interface.
- Scale plans.
- Design of goals, challenges and rewards to fit with chosen genre and audience.
- Design progression to fit with chosen genre and audience, e.g. progressive difficulty.

Students will use binomial expansion to expand larger binomial than seen at GCSE. They will cover trigonometry at a greater depth, introduced to trigonometric identities that they will use to solve trigonometric equations. They will also do problem solving with vectors. In Statistics, they will represent and interpret data using measures of location and spread.

Students will prove mathematical results by induction and study vectors to a greater depth, including scalar products and equations of lines and planes in 3D. In Decision, students will carry out algorithms and evaluate their effectiveness. They will be introduced to Graph Theory and will represent graphs and networks using matrices.

Term 5

Types of Programming Language / Computational Thinking - Students will learn about the different programming paradigms used in industry and how these are applied to different types of software. Students will also recap the fundamental features of computational thinking to ensure they are best prepared for their programming project. Programming Project - Students will spend term 5 completing their Analysis and Design aspects of the programming project. The successful completion of these portions of the project are critical to success in the development, testing and evaluation sections which follow. Students must focus on the decomposition of the problem and how they will break down the development process into multiple parts which can be tested. Following the successful completion of this section - students will be ready to begin developing their software solution and will test their product iteratively throughout development.

Unit 1: Media Representations: Topic D: Effects of representations. Students will explore the effects of representation. Each representation carries the values of the producer and shapes the opinions and beliefs of the audience. Students will cover:

- Positive and negative effects:
 - o copycat behaviour/education and information/ socialisation
- Objectification
- Stereotypes and archetypes
- Impact on individuals, groups and society (changes in behaviour, attitudes)
- Reinforcement of an ideology (dominant, counter)
- Challenging dominant ideology

 Revision for topic A, B, and C. Unit 12/13: Topic C: Students will be able to build and check a digital game.

Students will study exponentials and logarithms. They will be able to solve exponential and logarithmic equations, draw their graphs and transformations and use logarithmic graphs to model non-linear problems. Students will also revise the key content of the year in preparation for their end of year mock examination. In Statistics, they will be introduced to statistical distributions and hypothesis testing.

Students will find shortest and most effective pathways using various algorithms, including Kruskal's, Prim's, Dijkstra's and Floyd's. Students will also study linear programming, critical path analysis and the simplex algorithm