



Curriculum Plan Computing

Year 7

	Autumn	Spring	Summer
Units/Topics	<p>CS1 Introduction</p> <ul style="list-style-type: none"> • Expectations • Basic computer use • E-mail • MS Teams • Baseline assessment • Reinforcement exercises <p>IT1 Catholic Life (Research skills)</p> <ul style="list-style-type: none"> • Applications for purpose • Presentation skills • Research tasks <p>IT2 Online safety, personal safety and wellbeing</p> <ul style="list-style-type: none"> • Social networking & Cyberbullying • Privacy • Password security 	<p>CS2 Game Programming Concepts (Scratch)</p> <ul style="list-style-type: none"> • Interface • Programming games • PacMan game <p>CS2 Game Programming Concepts (Scratch)</p> <ul style="list-style-type: none"> • Algorithm consolidation, writing & implementing independently • Variables 	<p>IT3 Spreadsheet Modelling (Excel)</p> <ul style="list-style-type: none"> • Harry Plotter Theme • Formatting • Formulas • Functions • Graphs & Charts <p>IT4 Digital Literacy (Publisher/Word)</p> <ul style="list-style-type: none"> • Critically evaluate a websites content • How search engines work & Boolean searching • Copyright Law • Malware
Key Assessment	<ul style="list-style-type: none"> • Formative live assessment and interactive quizzes • Homework on Arbor • Summative teacher assessment and national curriculum grade awarded. 	<ul style="list-style-type: none"> • Formative live assessment and interactive quizzes • Homework on Arbor • Summative teacher assessment and national curriculum grade awarded. 	<ul style="list-style-type: none"> • Formative live assessment and interactive quizzes • Homework on Arbor • Summative teacher assessment and national curriculum grade awarded.
Why is it studied?	<p>Introduction: At Hagley Catholic High School we use Office 365 programs as part of our daily lessons. In our first unit CS1 we allow learners time to learn the upload and download techniques required. We take an initial data record with our baseline assessment.</p> <p>E-safety: This unit focuses on the personal safety and wellbeing of an individual. Students will learn to balance the benefits offered by technology with a critical awareness of their own and other’s online behaviour and develop effective strategies for staying safe and making a positive contribution online.</p>	<p>Scratch: Scratch is an introduction to programming and control. The software is free, pupils have the benefit of being able to use it at home. The interface is easy to use and pupils have fun while they are learning. This can be very motivating compared to command-line programming. If pupils create their own accounts on the Scratch site, then they can upload projects started in lesson time and continue working from them at home. The activities cover different features of Scratch v2* in order to give pupils the skills to develop their own projects with confidence. The SOW has been designed so that pupils are introduced in a structured way to a range of computing concepts.</p>	<p>Spreadsheets: Learners are introduced to the wonderful world of spreadsheets and the concept of cell referencing, they analyse, and manipulate data, before turning it into graphs and charts. Data is beautiful!</p> <p>Digital Literacy: At the end of this Unit all pupils should be able to: Use a Search Engine efficiently. Know how to check the reliability and trustworthiness of a website Know how to avoid copyright issues Identify malware and preventive measures Most pupils will be able to also: Demonstrate efficient searching criteria. Describe different virus types and how they infect a system Some pupils will be able to also:</p> <ul style="list-style-type: none"> • Use Boolean operators to search • Describe specific cyber attacks

Year 8

	Autumn	Spring	Summer
Unit/Topics	<p>CS3 Understanding Computers</p> <ul style="list-style-type: none"> • Hardware • Software • CPU • Storage • Binary <p>ASCII</p> <p>CS4 Computational Thinking Algorithms (Flowol)</p> <ul style="list-style-type: none"> • Control systems • Input/process/output • Algorithms • Sequence • Procedures 	<p>CS5 Programming Fundamentals (Micro:bit)</p> <ul style="list-style-type: none"> • Interface • Micro:bit Emulator • Variables • Accelerometer • Compass <p>CS6 Programming Basics (Python)</p> <ul style="list-style-type: none"> • Python IDLE • Numbers & Arithmetic • Variables • Operators • Bugs & errors 	<p>CS6 Programming Basics (Python) (Book to supplement)</p> <ul style="list-style-type: none"> • Selection • iteration <p>CS7 Computer crime & cyber security</p> <ul style="list-style-type: none"> • Legislation Acts - computer use, Copyright, data protection • Uploading personal data dangers • Protecting online identity • Identify fraudulent emails • Health and Safety hazards • Safe disposal of old technology
Key Assessment	<ul style="list-style-type: none"> • Formative live assessment and interactive quizzes • Homework on Arbor • Summative teacher assessment and national curriculum grade awarded. 	<ul style="list-style-type: none"> • Formative live assessment and interactive quizzes • Homework on Arbor • Summative teacher assessment and national curriculum grade awarded. 	<ul style="list-style-type: none"> • Formative live assessment and interactive quizzes • Homework on Arbor • Summative teacher assessment and national curriculum grade awarded.
Why is it studied?	<p>Understanding Computers: a theoretical unit covering the basic principles of computer architecture and use of binary. The Input-Process-Output sequence and the Fetch-Decode-Execute cycle are taught through practical activities. Simple binary to decimal conversion and vice versa, how text characters are represented using the ASCII code. Binary addition, binary patterns and a brief history of communication devices, how new technologies and applications are emerging and the pace of change.</p> <p>Computer control: an introduction to control systems in everyday life. Students will be able to identify control systems they come across in everyday life and be able to explain how they work. It will introduce students to flowchart symbols. Creating flowcharts to control systems from zebra lights & lighthouse to pelican crossings & car park barriers in Flowol.</p>	<p>Designed by the BBC as part of its Make it Digital initiative, the micro: bit is one of the world's smallest programmable computers. Aims to inspire the next generation of engineers and coders. Python Basics is designed to build upon the Unit CS2 Scratch graphical programming students have undertaken in year 7.</p> <p>Python 3 is used to introduce a textual based programming language and develop the principles of programming. The focus is on getting pupils to understand the process of developing programs, the importance of writing correct syntax, being able to formulate algorithms for simple programs and debugging their programs.</p>	<p>Learners are introduced to the major Acts concerning computer use. They are reminded about the dangers of putting personal data on social networking sites and briefly ways of protecting online identity. We study some of the signs of fraudulent emails and how to respond appropriately. We look at measures we should take to adhere to Copyright Law when using written text, downloading music etc. We consider the Health and Safety hazards associated with computer use how to safely dispose of an old computer</p>



Year 9

	Autumn	Spring	Summer
Unit/Topics	<p>CS8 Advanced Programming Concepts (Python)</p> <ul style="list-style-type: none"> Recap features from CS6 Pseudocode Sequence Selection/decision Repetition <p>CS8A (Alternative Pathway) Programming Concepts</p> <ul style="list-style-type: none"> Creating algorithms Programming algorithms Testing algorithms <p>IT5 Graphics Design</p> <ul style="list-style-type: none"> Graphic logos Spot the difference Movie posters Catholic Life (values) graphic 	<p>IT6 Web Design</p> <ul style="list-style-type: none"> Writing HTML code Communication and the Internet Band theme CSS <p>CS9 Networks</p> <ul style="list-style-type: none"> WWW vs Internet Domains LANs/WANs, packet switching Topologies Encryption 	<p>IT7 Sound Editing (Audacity)</p> <ul style="list-style-type: none"> Audience & purpose of sound clips Plan a radio advert Create radio advert Evaluate advert <p>IT8 Future of Technology (Publisher/Word)</p> <ul style="list-style-type: none"> Famous People Historical, Current research topic –
	(IDEA: Inspiring Digital Enterprise Award Bronze Award) IDEA		
Key Assessment	<ul style="list-style-type: none"> Formative live assessment and interactive quizzes Homework on Arbor Summative teacher assessment and national curriculum grade awarded. 	<ul style="list-style-type: none"> Formative live assessment and interactive quizzes Homework on Arbor Summative teacher assessment and national curriculum grade awarded. 	<ul style="list-style-type: none"> Formative live assessment and interactive quizzes Homework on Arbor Summative teacher assessment and national curriculum grade awarded.
Why is it studied?	<p>Advanced programming concepts: Pupils will develop their text based programming learning with the introduction of iteration through for loops and compare their use with while loops, before moving on to arrays (lists). This unit is designed to take pupils right up to a point where a GCSE in Computing can pick up from and should provide ample experience of programming in order to confirm any decision to pursue Computing as a GCSE option.</p> <p>Graphics and Design: Graphics packages are a very useful and necessary tool that students need both within ICT and for project and other work for their subjects. This SoW addresses that need by covering the basic graphics tools that they will need to use and then</p>	<p>Web Design: Pupils will design and implement a sequence of linked web pages. Over the seven lessons, pupils should develop sufficient understanding of web technology to create and evaluate an efficient and effective website design. Pupils will be aware how web pages can be produced using different methods (HTML/web authoring software).</p> <p>Networks: This is a theoretical unit covering the basic principles and architecture of local and wide area networks. Pupils will learn that the World Wide Web is part of the Internet, and how web addresses are constructed and stored as IP addresses. Client-server, peer-to-peer networks and the concept of</p>	<p>Sound editing: Pupils will develop a creative piece that will involve selecting, using, and combining multiple sources; analysing media to meet the needs of known users, they will create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability.</p>



	giving them short enjoyable tasks to practise.	cloud computing are all described. Ways of keeping data secure and simple encryption techniques are also covered.	
--	--	---	--

Year 10 – Computer Science

	Autumn	Spring	Summer
Units/Topics	<p>1.1.1 Architecture of the CPU Purpose of the CPU and the FDE cycle and the features of Von-Neumann architecture devices. Purpose and function of the ALU, CU, Cache and Registers Explain</p> <p>1.1.2 CPU performance The characteristics of CPUs and their effect on performance (Clock speed, Cache size, Number of cores)</p> <p>1.1.3 Embedded systems Explain the purpose of embedded systems and name examples.</p> <p>1.2.1 Primary storage (Memory) ROM, Cache, RAM, Virtual</p> <p>1.2.2 Secondary storage Primary memory and secondary storage.</p> <p>1.2.3 Units Name the units of storage between bit and Petabyte. Denary, Binary, Hexadecimal conversion Calculate data capacity requirements within a system.</p> <p>2.2.1 Programming fundamentals The use of variables, constants, operators, inputs, outputs and assignments</p> <ul style="list-style-type: none"> The use of the three basic programming constructs used to control the flow of a program: <ul style="list-style-type: none"> Sequence Selection <p>Iteration (count- and condition-controlled loops)</p>	<p>1.2.4 Data storage Numbers Convert numbers between binary, denary and hexadecimal representation. The purpose and use of number systems. Perform binary addition. Perform binary shifts.</p> <p>Character Character sets Compare and contrast ASCII & Unicode</p> <p>Images Bitmap image storage in a computer system.</p> <p>Metadata</p> <p>Sound Quality and size of image and sound files is affected by a range of factors.</p> <p>1.2.5 Compression Compression; lossy and lossless compression.</p> <p>2.3.1 Defensive design Defensive design considerations: Anticipating misuse Authentication Input validation Maintainability: Use of sub programs Naming conventions Indentation Commenting</p> <p>2.2.3 Additional programming techniques Random number generation The use of records to store data The use of arrays (or equivalent) when solving problems, including both one-dimensional (1D) and two-dimensional arrays (2D)</p>	<p>1.3.1 Networks and topologies Types of network: LAN (Local Area Network) WAN (Wide Area Network) Factors that affect the performance of networks The different roles of computers in a client-server and a peer-to-peer network The hardware needed to connect stand-alone computers into a Local Area Network: Wireless access points Routers Switches NIC (Network Interface Controller/Card) Transmission media The Internet as a worldwide collection of computer networks: DNS (Domain Name Server) Hosting The Cloud Web servers and clients Star and Mesh network topologies</p> <p>1.3.2 Wired & wireless networks, Protocols & layers Modes of connection: Wired, Ethernet, Wireless , Wi-Fi , Bluetooth , Encryption IP addressing and MAC addressing Standards Common protocols including: TCP/IP, HTTP, HTTPS, FTP, POP, IMAP, SMTP The concept of layers</p> <p>2.1.2 Defining creating and refining algorithms Trace tables</p> <p>Start Programming Project</p> <p>2.2.3 Additional programming techniques The use of SQL to search for data</p>

	<ul style="list-style-type: none"> o Social engineering, e.g. phishing, people as the 'weak point' o Brute-force attacks o Denial of service attacks o Data interception and theft o The concept of SQL injection <p>1.4.2 Identifying and preventing vulnerabilities.</p> <p>Common prevention methods:</p> <ul style="list-style-type: none"> o Penetration testing o Anti-malware software o Firewalls o User access levels o Passwords o Encryption o Physical security <p>1.5.1 Operating systems</p> <p>The purpose and functionality of operating systems:</p> <ul style="list-style-type: none"> o User interface o Memory management and multitasking o Peripheral management and drivers o User management o File management <p>Programming Project</p> <p>2.4.1 Boolean Logic</p> <p>Simple logic diagrams using the operators AND, OR and NOT</p> <ul style="list-style-type: none"> o Truth tables o Combining Boolean operators using AND, OR and NOT o Applying logical operators in truth tables to solve problems <p>2.3.2 Testing</p> <p>The purpose of testing</p> <p>Types of testing:</p> <ul style="list-style-type: none"> o Iterative o Final/terminal <p>Identify syntax and logic errors</p> <p>Selecting and using suitable test data:</p> <ul style="list-style-type: none"> o Normal o Boundary o Invalid/Erroneous o Refining algorithms 	<ul style="list-style-type: none"> o Data compression <p>1.6.1 Ethical, legal, cultural and environmental impact</p> <p>Impacts of digital technology on wider society including:</p> <ul style="list-style-type: none"> o Ethical issues o Legal issues o Cultural issues o Environmental issues o Privacy issues <p>Legislation relevant to Computer Science:</p> <ul style="list-style-type: none"> o The Data Protection Act 2018 o Computer Misuse Act 1990 o Copyright Designs and Patents Act 1988 o Software licences (i.e. open source and proprietary) <p>Programming Project</p> <p>2.5.1 Languages</p> <p>Characteristics and purpose of different levels of programming language:</p> <ul style="list-style-type: none"> o High-level languages o Low-level languages <p>The purpose of translators</p> <p>The characteristics of a compiler and an interpreter</p> <p>2.5.2 The integrated Development Environment</p> <p>Common tools and facilities available in an Integrated Development Environment (IDE):</p> <ul style="list-style-type: none"> o Editors o Error diagnostics o Run-time environment o Translators 	
--	---	---	--



	<p>2.1.3 Searching and sorting algorithms Standard searching algorithms: Binary search Linear search</p> <p>Standard sorting algorithms: Bubble sort Merge sort Insertion sort</p>		
Key Assessment	End of unit assessments Timetabled PPE’s	End of unit assessments Timetabled PPE’s	
Why is it studied?	<p>In the final year of this two year course, we continue with the programming project as tis prepares learners for their algorithms paper. We look a the theory of democracy and rule of law in IT. Our study of environmental and ethical issues in computing encompasses our whole school delivery of mutual respect and tolerance for each other and our environment.</p> <p>Studies include the theory of algorithms and determining whether a system works as it is intended to as we test it for logic and syntax errors.</p>	<p>Building on from the theory of machine code in year 10, we study the theory of how computers interpret a human’s high level coding into to machine language and how we make use of IDE’s to support the development of code.</p> <p>As well as the everyday application software we use, we introduce learners to the utility software that runs in the background of what we are doing. How does our operating system load? How to we manage all of that wonderful filing?</p>	

Curriculum Plan KS4 iMedia

Year 10

	Autumn	Spring	Summer
Units/Topics	<p>R093 Creative iMedia Media sectors and products. Media codes: Symbolic and Technical Audience segmentation categories Purpose of media products Primary research</p>	<p>Visual identity Client requirements, how they are defined and interpreting a client brief Pre-production planning Planning Legislation</p>	<p>R094 - Visual identity and digital graphics - NEA</p> <p>How can we make a digital graphics product?</p> <p>Identify timescales for production</p>



	<p>Secondary research Work plan Idea generation Pre-production skills: The purpose, uses and contents for:</p> <ul style="list-style-type: none"> • Camera angles • Lighting • Colour choices • Mood boards • Mind maps/spider diagrams • Visualisation diagrams • Storyboards • Scripts • Why & how digital graphics are used • Types of digital graphics • File formats • The properties of digital graphics and their suitability for use in creating images how different purposes and audiences influence the design and layout of digital graphics <p>Media codes used to convey meaning, create impact and / or engage audiences. R094 - Visual identity and digital graphics - Practise NEA</p>	<p>Regulation classification and certification Distribution considerations Image files Audio files Moving image Factors influencing product design How style content and layout are linked to the purpose</p> <p>Audience demographics and segmentation</p>	<p>How to conduct and analyse research Produce a work plan and production schedule Identifying & categorise target audience Hardware, techniques and software used Health and safety legislation</p> <p>Work planning Documents used to support ideas generation Documents used to design and plan media products The Legal aspects that affect media Intellectual property rights Regulation certification and classification Health and safety</p>
	Job roles in the media sector		
Key Assessment	<p>End of topic assessments. The application of new skills and theories applied in the NEA. Timetabled PPE's</p>	<p>End of topic assessments. The application of new skills and theories applied in the NEA. Timetabled PPE's</p>	<p>End of topic assessments. The application of new skills and theories applied in the NEA. Timetabled PPE's</p>
Why is it studied?	<p>Interactive Media all around us now. As the quick scan of a QR code we can access a plethora of websites or applications. In Creative iMedia we look at how audience needs and developments in the media industry.</p> <p>The Creative iMedia qualification consists of three components, which are taught across two academic years. Learners apply the theory knowledge taught in a practice NEA before completing an independent NEA based on a scenario issued by the exam board.</p> <p>The learning builds upon KS3 digital skills and knowledge where they apply their skills to a situation.</p> <p>Two units are NEA. Learners are provided with a client brief, they are required to interpret the brief, prepare creative pre-production materials, deliver a suitable product and then review their outcome against the requirements of the brief.</p> <p>We cover the requirements of knowing the job roles in iMedia throughout the year as each lesson we consider what career opportunities are available in the area that we just covered.</p> <p>This prepares learners for adult life in that they are required to consider the requirements of others and apply their creative side to produce a suitable solution and self-evaluate it.</p> <p>The examined unit theory is taught alongside the requirements of the NEA and then completed for the final examination.</p>		



	Autumn	Spring / Summer
Units R097 R093 Topics 4	R097 – Interactive Digital Media Product <ul style="list-style-type: none"> Interpret client requirements for pre-production Types of interactive digital media, content, and associated hardware. Features and conventions of interactive digital media. Features and conventions of interactive digital media. Hardware and software used to create interactive digital media. Pre-production and planning documentation and techniques for interactive digital media. Create pre-production documentation for interface planning such as wire frames and storyboards. Create re-production documentation and planning for user interaction: Identify the assets required and explain their planned use in your IDMP. <p>Distribution considerations Distribution platforms and media t reach audiences Properties and formats of media files Image files Audio files Moving image Files File compression</p>	R093 – Examination – January Source, create, and repurpose the media components for the interactive digital media product (IDMP). You will then combine the media, interactive and navigational components to create the IDMP you have designed and planned <ul style="list-style-type: none"> Create the components: Source and create the media assets which will form components of your IDMP. Repurpose the media assets to make them suitable for your IDMP. In this task you must test/check and review the final interactive digital media product (IDMP). You must also explain any improvements and further developments which could be made.
	Job roles in the media sector	
Key Assessment	The application of new skills and theories applied in the NEA. Timetabled PPE’s	The application of new skills and theories applied in the NEA. Timetabled PPE’s
Why is it studied?	<p>Interactive Media all around us now. As the quick scan of a QR code we can access a plethora of websites or applications. In Creative iMedia we look at how audience needs and developments in the media industry.</p> <p>The Creative iMedia qualification consists of three components, which are taught across two academic years.</p> <p>The learning builds upon KS3 digital skills and knowledge where they apply their skills to a situation.</p> <p>Two units are NEA. Learners are provided with a client brief, they are required to interpret the brief, prepare creative pre-production materials, deliver a suitable product and then review their outcome against the requirements of the brief.</p> <p>We cover the requirements of knowing the job roles in iMedia throughout the year as each lesson we consider what career opportunities are available in the area that we just covered.</p> <p>This prepares learners for adult life in that they are required to consider the requirements of others and apply their creative side to produce a suitable solution and self-evaluate it.</p>	



	<p>The examined unit theory is taught alongside the requirements of the NEA and then completed for the final examination.</p>
--	---