"Whether you want to uncover the secrets of the universe, or you want to pursue a career in the 21st century, basic computer programming skills is essential skill to learn." **Stephen Hawking**

Curriculum Map Computing

Intent

It is the aim of the department to enable students to develop skills and knowledge in computer science, digital technologies and online safety to prepare them for a future in a world where the use of this technology is fully embodied.

Students will be given the opportunity to develop their computer coding skills. Learning the language of code is an important as students will be able to grasp the magic behind the computers.

Key Stage 3 Curriculum Computing

1. Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems.
2. Understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem.
3. Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions.

Key Stage 2 Curriculum Computing

Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.
Use sequence, selection, and repetition in programs; work with variables and various forms of input and output
Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration
Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content

4. Understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal] 5. Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems. 6. Understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits. 7. Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability. 8. Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns.	Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. **Strands of Computing** **Information Technology** **Computer Science** **Digital Literacy**

7	**Impact of technology – Collaborating online respectfully** **Rationale:** Important that students can effectively use the school systems to aid the transition from primary to secondary. E-safety is looked at as the first unit as its fundamental that students that students have this knowledge first. **Substantive:** Identify how to use online collaboration tools respectfully.	**Networks: from semaphores to the internet** **Rationale:** As students using a network in school. How are they used to share information? **Substantive:** Recognise networking hardware and explain how networking components are used for communication. **Disciplinary:** Understand how networks can be used to retrieve and share information. **Key words:** network, protocol, mainframe, personal computer, stand-alone, HTTP,	**Using media: gaining support for a cause** **Rationale:** Students now using software to support computing work. They will develop a deeper understanding of information technology and digital literacy by using their skills across the unit to create a blog post about a real world cause that they are passionate about and would like to gain support for. **Substantive:** Able to create digital products for a real-world cause. **Disciplinary:** Use software tools appropriately to	**Programming essentials in Scratch part 1** **Rationale:** Teaching programming in Year 7 is important for two core reasons: it is a form of digital literacy and develops problem-solving skills, secondly by embedding this skill in Year 7 we can build in later years. **Substantive:** Apply the programming constructs of sequence, selection and iteration in Scratch. **Disciplinary:** Create programs independently to allow computers to solve problems. **Keywords:** sequencing, subroutines, instructions, execute, variables,	**Programming essentials in Scratch part 2** **Rationale:** Teaching programming in Year 7 is important for two core reasons: it is a form of digital literacy and develops problem-solving skills, secondly by embedding this skill in Year 7 we can build in later years. **Substantive:** Use subroutines to decompose a problem that incorporate lists in Scratch. **Disciplinary:** Create programs independently to allow computers to solve problems.	**Modelling data spreadsheets** **Rationale:** The spreadsheet unit for Year 7 takes learners from having very little knowledge of spreadsheets to being able to confidently model data with a spreadsheet. This unit will give learners a good set of skills that they can use in computing lessons and in other subject areas. **Substantive:** Able to sort and filter data using formulas and functions in spreadsheet software. **Disciplinary:** Understand how data

	Able to use the computing lab appropriately. **Disciplinary:** Understand the risks when using technology and how to protect against them. **Key words:** computing, password, secure, hazards, email, recipient, network, online, comments, community, cyberbullying, presentation software, slide deck, audience, catfishing	network cable, hub, server, router, ISP, Wired, wireless, 3G, 4G, 5G, WiFi, bandwidth, bit, megabit, gigabit, broadband, buffering, internet, router, IP address, packet header, payload, transmission control protocol, internet protocol, internet, world wide web, WWW, services, email, voice over internet protocol (VoIP), internet of things (IoT), spam, privacy, security, web browser, web server, web page, search engine, HTTPS, URL**,** domain name, system.	support work. Select and create a range of media. **Key words:** application software, word processor, formatting, fonts, icons, appropriate, copyright, licensing, creative commons, text wrapping, cropping, recolouring, credibility, source, audience, plagiarism, referencing, citation, paraphrase, blog, assessment criteria, feedback, summative.	commands, execute, input, process, output, storage, tracing, expressions, evaluate, conditions, selection, if statements, iteration, count-controlled, condition-controlled, debugging.	Be able to comprehend, design, create and evaluate algorithms. **Keywords:** sequencing, subroutines, instructions, execute, variables, input, process, output, storage, tracing, expressions, evaluate, conditions, selection, if statements, operators, logic, comparison, expressions, evaluate, iteration, count-controlled, condition-controlled, debugging, variables, conditions.	is used to represent real-world scenarios **Keywords:** data, cell, cell reference, row, column, range, select, drag handle, autofill, formula, Formula, autofill, information, primary source, secondary source, chart, pie chart, bar, series, axis/axes, labels, headers, function, maximum, minimum, Header, filter, average, criterion/criteria, condition, conditional formatting.

8	**Media: Vector graphics** **Rationale:** Vector graphics can be used to design anything from logos and icons to posters, board games, and complex illustrations. Through this unit, students will be able to better understand the processes involved in creating such graphics and will be provided with the knowledge and tools to create their own. **Substantive:** Able to create vector	**Representations from clay to silicon** **Rationale:** This unit conveys essential knowledge relating to binary representations. The activities gradually introduce learners to binary digits and how they can be used to represent text and numbers. **Substantive:** Understand how to represent numbers and text using binary digits **Disciplinary:** Understand what a computer is in terms of how data is stored.	**Mobile app development** **Rationale:** Today, there's an app for every possible need. With this unit you can take learners through the entire process of creating their own mobile app. Building on the programming concepts learners used in previous units. **Substantive:** Able to use event driven programming to create an online gaming app **Disciplinary:** Create software to allow	**Computing systems** **Rationale:** This unit takes learners on a tour through the different layers of computing systems: from programs and the operating system, to the physical components that store and execute these programs, to the fundamental binary building blocks that these components consist of. This unit needs no prior knowledge but does build data representations. **Substantive:** Explore fundamental elements that make up a computer system	**Introduction to python programming** **Rationale:** This unit introduces learners to text-based programming with Python. The lessons form a journey that starts with simple programs involving input and output, and gradually moves on through arithmetic operations, randomness, selection, and iteration. The Year 7 Programming units are a prerequisite for this unit. **Substantive:** Apply the programming constructs of	**iDEA** **Rationale:** By the end of year 9 students should be capable of working independently on the Silver badges with computers in a range of fields. iDEA is a nationally recognised qualification which is gained by students working on badges covering topics across all aspects of computing. Students can pick which badges to complete, enabling them to work on their preferred topics **Substantive:** How do I write/ edit code? How do I use algorithms to

	graphics through objects, layering and path manipulation **Disciplinary:** Able to select and create a range of media including text, images, sounds, and video **Keywords:** vector, raster, bitmap, paths, pixels, rectangle, ellipse, segment, arc, polygon, star, fill, stroke, select, move, resize, rotate, duplicate, flip, z-order, operations, group, ungroup, align, distribute, union, difference, intersection, equidistant, object, path, node, freehand, path	**Keywords:** representations, symbols, storage, communication, processing, symbols, characters, coding (encoding/decoding), coding scheme, representation size or length, physical medium, binary digits, digital systems, decimal numbers, binary numbers, conversion (between number systems), Representation size, units, multiples, prefixes.	computers to solve problems **Keywords:** decomposition, mobile, app (application), properties, Event-driven programming, variables, sequence, workspace, properties, ids, parameters, object properties, object ids, errors, event handler, input, checkbox, object properties, object ids, event handler, input, checkbox, object properties, checkbox	**Disciplinary:** Understand what a computer is, and how its constituent parts function together as a whole **Keywords:** Computer, system, device, program, software, instructions, instructions, data, hardware, processor, memory, storage, communication, input and output, architecture, hardware, processor, operating system, logical operators (NOT, AND, OR), logical expressions, truth values (true, false), truth tables, logic gates, logic circuits, hardware components, artificial intelligence, machine learning, data, training, testing, programming, Free and open source software.	sequence, selection and iteration in Python **Disciplinary:** Create programs independently to allow computers to solve problems **Keywords:** Algorithm, program, programming language, program translation and execution, interpreter, programming environment, input, output, variables, assignment, operators, expressions, integer and string type, execution, selection, relational (or comparison) operators, logical (or Boolean) expressions,	solve problems? How do computers think? What do the individual parts of a computer do? How are computers used to communicate? How do aspects of the virtual world work (bitcoin etc..) How do I solve problems using software? How effective are existing solutions? How can I stay safe? How ethical are some aspects of virtual society? **Disciplinary:** Students will learn/ retrieve a wide range of computer skills and knowledge to gain their award, the badges cover all aspects of digital learning but they don't have to do every

	segment, handles, monochrome, logo, illustration, icon, pixels, illustrations, icons, algorithms, formulae, scalable, svg (Scalable Vector Graphic).				conditions, randomness, execution, walk-through, Multi-branch selection, relational (or comparison) operators, logical (or Boolean) expressions, conditions, iteration, execution	badge so the skills they utilise will vary. All students will also learn/ utilise skills in time planning (not all badges allow to save part way through) and independence/ research skills **Keywords:** citizenship, etiquette, ethics, communication, presentation, problem solving, creativity, design, innovation, origination, aiming high, planning, data, research, strategy, problem solving, lateral thinking, staying positive, resilience, editing, leadership, teamwork, evaluation, money management, production, coding

9	**Cybersecurity** **Rationale:** Builds on safety concepts previously looked at in Year 7. Focus now on techniques cybercriminals use to steal data, disrupt systems, and infiltrate networks. **Substantive:** Identify how users and organisations can protect themselves from cyberattacks **Disciplinary:** Understand the risks when using technology and how	**Media: animations** **Rationale:** Films, television, computer games, advertising, and architecture have been revolutionised by computer-based 3D modelling and animation. In this unit learners will discover how professionals create 3D animations using the industry-standard software package **Substantive:** Create 3D animations through object manipulation and tweaking and adjusting lighting and camera angles **Disciplinary:**	**Data science** **Rationale:** In this unit, learners will be introduced to data science, and by the end of the unit they will be empowered by knowing how to use data to investigate problems and make changes to the world around them. **Substantive:** Use data to investigate problems and make real-world changes **Disciplinary:** Able to analyse data and meeting the needs of known users. **Keywords:** data science, visualisation,	**Representations: going audiovisual** **Rationale:** Draws on familiar examples of composing images out of individual elements, mix elementary colours to produce new ones, take samples of analogue signals to illustrate these ideas, and then bring all these things together to form one coherent narrative. **Substantive:** Represent images and sounds using binary digits **Disciplinary:** Understand how instructions are stored and executed within a	**iDEA** **Rationale:** By the end of year 8 students should be capable of working independently on the Bronze badges with computers in a range of fields. iDEA is a nationally recognised qualification which is gained by students working on badges covering topics across all aspects of computing. Students can pick which badges to complete, enabling them to work on their preferred topics **Substantive:** How do I write/ edit code? How do I use	**Physical computing** **Rationale:** Use physical computing to demonstrate skills picked up in prior programming. Physical computing offers tactile and sensory experience to enhance learning. **Substantive:** Able to use sensing and controlling with the micro:bit **Disciplinary:** Create programs independently to allow computers to solve problems **Keywords:** Input, output, sensors, hardware

	to protect against them. **Keywords:** Data, information, cybersecurity, cybercriminals, profiling, user behaviour, privacy policies, data protection, data subject, data portability, malware, social engineering, phishing, blagging, shouldering, name generator attack, scam, Cyberthreats, ethical hacking, penetration testing, brute force attacks, script kiddies, DoS (denial of service), DDoS (distributed denial of service), ransomware, viruses, trojans, worms, adware,	Select and create a range of media including text, images, sounds, and video. **Keywords:** Object, sphere, cone, add, move, rotate, scale, colour (material), Keyframe, tweening, stop motion, object, animation, location, timeline, parenting, Edit mode, scale, extrude, loop cut, face, edge, vertex, Proportional editing, knife tool, organic, subdivision, Render, lights, camera, focus, ray tracing.	insight, infographic, Data, prediction, criteria, outliers, Correlation, PPDAC, investigative cycle, PPDAC, investigative cycle, data capture, data source, analysis, data cleansing, conclusion.	computer system in the form of binary digits. **Keywords:** digital image, binary image representation, picture elements, pixels, resolution, colour depth, bitmap or raster images, RGB colour, representation size, compression, image editing functions, Sound, waves, microphone, speaker, analogue, digital, digitisation, digital sound representation, sampling rate, sample size, trade-offs, sound editing, symbolic representations, vector graphics, compression.	algorithms to solve problems? How do computers think? What do the individual parts of a computer do? How are computers used to communicate? How do aspects of the virtual world work (bitcoin etc..) How do I solve problems using software? How effective are existing solutions? How can I stay safe? How ethical are some aspects of virtual society? **Disciplinary:** Students will learn/ retrieve a wide range of computer skills and knowledge to gain their award, the badges cover all	components, selection, iteration, expressions, list, circuits, wireless, Project, design, problem, audience, prototype, decomposition, processing, problem.

	spyware, bots, botnet, Anti-malware, firewall, end-user authentication, folder permissions/privileges, biometrics, two-factor authentication (2FA), CAPTCHA, Internet Service Provider (ISP), auto-updates.				aspects of digital learning but they don't have to do every badge so the skills they utilise will vary. All students will also learn/ utilise skills in time planning (not all badges allow to save part way through) and independence/ research skills **Keywords:** Safeguarding, ethics, cybersecurity, safety, problem solving, ethics, safety, fake news, social media, safeguarding, surfing, data, organisation, internet of things, data, organisation, coding, algorithms, design, image, creativity, budgeting, business administration, social media,	

					communication, marketing	

GCSE Computer Science Curriculum Map

10	**Systems Architecture** **Rationale:** Paper 1 unit Fundamental students understand how a computer works **Architecture of the CPU** **CPU Performance** **Embedded Systems** **Substantive:** What actions occur at each stage of the fetch-execute cycle The role/purpose of each component and what it manages, stores, or controls during the fetch-execute cycle The purpose of each register, what it stores (data or address) The difference between storing data and an address Understanding of each characteristic as listed	**Memory and Storage** **Rationale:** Paper 1 unit Once students understand how a CPU works they need to understand how data is stored on a Computer **Primary Storage** **Secondary Storage** **Units** **Numbers** **Characters** **Images** **Sound** **Compression** **Substantive:** Why computers have primary storage Key characteristics of RAM and ROM Why virtual memory may be needed in a system How virtual memory works Why computers have secondary storage Recognise a range of secondary storage devices/media	**Networks, Connections and Protocols** **Rationale:** Paper 1 unit Start of units related to networking. **Network Topologies** **Wired, Wireless,** **Protocols and layers** **Substantive:** The characteristics of LANs and WANs including common examples of each Understanding of different factors that can affect the performance of a network. The tasks performed by each piece of hardware The concept of the Internet as a network of computer networks A Domain Name Service (DNS) is made up of multiple Domain Name Servers	**Network Security** **Rationale:** Paper 1 unit Builds on knowledge of networking to include security of a network **Threats to Computer Systems and Networks** **Substantive:** Threats posed to devices/systems. Knowledge/principles of each form of attack. Understanding of how to limit the threats posed. Understanding of methods to remove vulnerabilities Knowledge/principles of each prevention method Understand that computers often come with utility software, and	**Systems Software** **Rationale:** Paper 1 unit Now students understand how a computer and network works they need to understand the software needed. **Substantive:** What each function of an operating system does Features of a user interface Memory management Understand that: Data is transferred between devices and the processor User management functions File management, and the key features **Disciplinary:**	**Ethical, legal, cultural and environmental impacts of digital technology** **Rationale:** Paper 1 unit Last unit for Paper 1. Long answer questions on impacts of digital technology. **Substantive:** Technology introduces ethical, legal, cultural, environmental and privacy issues Knowledge of a variety of examples of digital technology and how this impacts on society The purpose of each piece of legislation and the specific actions it allows or prohibits The need to license software and the purpose of a software licence Features of open source (providing access to the source code and the ability to change the software)	**Programming languages and Integrated Development Environments** **Rationale:** Paper 2 unit Taught alongside Paper 1 Students introduced to the CA requirements 20 hours and start to look at the reference language. **Substantive:** Learn the OCR reference language and programming language python Understanding of each programming technique Recognise and use the operators. Understand the use of data types **Disciplinary:** Apply the reference language and python to given scenarios Ability to choose suitable data types for

	red What embedded systems are Typical characteristics of embedded systems **Disciplinary:** Be able to apply their knowledge in context within scenarios The effects of changing any of the common characteristics on system performance, either individually or in combination Familiarity with a range of different embedded systems **Literacy:** Fetch Decode Execute Instructions Data Signals ALU (Arithmetic Logic Unit) CU (Control Unit) Cache Registers MAR (Memory Address Register) MDR (Memory Data Register) Program Counter	Differences between each type of storage device/medium Compare advantages/disadvantages for each storage device Why data must be stored in binary format Familiarity with data units and moving between each Data storage devices have different fixed capacities Calculate required storage capacity for a given set of files Calculate file sizes of sound, images and text files Denary number range 0 – 255 Hexadecimal range 00 – FF Binary number range 00000000 – 11111111 Understanding of the terms 'most significant bit', and 'least significant bit' base Ability to deal with binary numbers containing between 1 and 8 bits	A DNS's role Concept of servers providing services Concept of clients requesting/using services from a server Advantages and disadvantages of the Cloud Advantages and disadvantages of the Star and Mesh topologies Compare benefits and drawbacks of wired versus wireless connection ü Recommend one or more connections for a given scenario The principle of encryption to secure data across network connections IP addressing and the format of an IP address (IPv4 and IPv6) A MAC address is assigned to devices; its use within a network ü The principle of a standard to provide rules for areas of computing	how this performs housekeeping tasks Purpose of the identified utility software and why it is required **Disciplinary:** Apply understanding of network security to a given scenarios. **Literacy:** Encryption Brute Force SQL Malware Virus Trojan Adware Worm Ransomware Spyware Bot Pen Testing Network Forensics Security	Able to compare and constructs different types of Operating Systems **Literacy:** GUI User management Peripheral management, User Interface, Memory Management, File management	Features of proprietary (no access to the source code, purchased commonly as off-the-shelf) **Disciplinary:** An ability to competently discuss the impact of technology based around the issues listed. Recommend a type of licence for a given scenario including benefits and drawbacks Applying command words to a given scenario **<u>Literacy</u>** Legislation, Copyright, Software licences, Open Source, Proprietary software, Source code, Privacy, Cultural, Ethical, Stakeholders, Environmental, E-waste, Digital divide	data in a given scenario **Literacy** Comment Assignment Constants Global Variables Input Output Casting Iteration Selection Sequence String Length Substrings Concatenation ASCII File Handling Arrays Procedure Function Random Float Real Integer Character String High level Language Low level Language Machine Code Assembly language Interpreter Compiler Integrated Development Environmental (IDE) Debugging

	Accumulator Cache Cores Clock Speed	Understand the effect of a binary shift (both left or right) on a number Carry out a binary shift (both left and right) How characters are represented in binary How the number of characters stored is limited by the bits available Each pixel has a specific colour, represented by a specific code The effect on image size and quality when changing colour depth and resolution Metadata stores additional image information How sound can be sampled and stored in digital form The effect of sample rate, duration and bit depth on: o The playback quality o The size of a sound file Advantages and disadvantages of each type of compression Effects on the file for each type of compression	Standards allows hardware/software to interact across different manufacturers/producers The principle of a (communication) protocol as a set of rules for transferring data That different types of protocols are used for different purposes The basic principles of each protocol i.e. its purpose and key features How layers are used in protocols, and the benefits of using layers; **Disciplinary:** Apply understanding of networks to a given Scenario Compare benefits and drawbacks of wired versus wireless connection Recommend one or more connections for a given scenario **Literacy:**				Syntax

		Disciplinary: Be able to apply their knowledge in context within scenarios Conversion of any number in these ranges to another number The differences between and impact of each character set **Literacy:** ROM RAM Volatile Non-volatile Storage Read Write Virtual Memory Optical Magnetic Solid State Capacity Speed Portability Durability Reliability Cost Bit Nibble Byte Kilobyte Megabyte Gigabyte Terabyte Petabyte Binary Denary Hexadecimal Character set Pixels Metadata Colour Depth Resolution Lossy Lossless	Client Server Peer-to-Peer LAN WAN Network Interface Controller Router Hub Switch Wireless Access Point Server DNS Cloud Hosting Mesh Star Packet Switching Layers Protocols HTTP HTTPS FTP SMTP POP IMAP TCP/IP Wired Wireless Wi-fi IP MAC				
11	**<u>Programming languages and Integrated Development Environments</u>**	**<u>Producing Robust programs</u>** **Rationale:** Paper 2 unit	**<u>Programming Fundamentals</u>** **Rationale:** Paper 2 unit	**<u>Algorithms</u>** **<u>Rationale:</u>** Paper 2 unit From knowledge of programming in	**<u>Boolean Logic</u>** **<u>Rationale:</u>** Paper 2 unit This unit does not require the	**Revision and Exams**	

	Rationale: Paper 2 unit Following the knowledge from Year 10 students continue with CA **Substantive** Learn the OCR reference language and the language of Python Understanding of each programming technique Recognise and use the operators. Understand the use of data types The differences between high- and low-level programming languages The need for translators The differences, benefits and drawbacks of using a compiler or an interpreter Knowledge of the tools that an IDE provides How each of the tools and facilities	This unit will be looked at alongside programming languages and the CA as students can see how the CA knowledge can be applied to the exam for Paper 2 **Substantive** Understanding of the issues a programmer should consider to ensure that a program caters for all likely input values Understanding of how to deal with invalid data in a program Authentication to confirm the identity of a user Understand why commenting is useful and apply this appropriately The difference between testing modules of a program during development and testing the program at the end of production Syntax errors as errors which break the grammatical rules of the programming language	This unit will be looked at alongside programming languages and the CA as students can see how the CA knowledge can be applied to the exam for Paper 2 **Substantive** Practical use of the data types in a high-level language Understand that data types may be temporarily changed through casting, and where this may be useful Ability to manipulate strings, including: Concatenation Slicing Arrays as fixed length or static structures Use of 2D arrays to emulate database tables of a collection of fields, and records The use of functions The use of procedures Where to use functions and	previous units students can apply computational thinking **Substantive** Understand the principles of computational thinking: o Abstraction o Decomposition o Algorithmic thinking Produce simple diagrams to show: The structure of a problem Subsections and their links to other subsections. Complete, write or refine an algorithm Identify syntax/logic errors in code and suggest fixes Create and use trace tables to follow an algorithm Understand the main steps of each algorithm Apply the algorithm to a data set	programming but does require the logically computational thinking skills from the previous unit **Substantive** Knowledge of the truth tables for each logic gate Recognition of each gate symbol **Disciplinary** Understanding of how to create, complete or edit logic diagrams and truth tables for given scenarios **Literacy** Boolean, Truth tables Logic AND, OR, NOT Gate	

	listed can be used to help a programmer develop a program **Disciplinary** Apply the reference language and python to the given scenarios suitable data types for data in a given scenario **Literacy** Comment Assignment Constants Global Variables Input Output Casting Iteration Selection String Length Substrings Concatenation ASCII File Handling Arrays Procedure Function Random Float Real Integer Character	and stop it from being run/translated Logic errors as errors which produce unexpected output Normal test data as data which should be accepted by a program without causing errors Boundary test data as data of the correct type which is on the very edge of being valid Invalid test data as data of the correct data type which should be rejected by a computer system Erroneous test data as data of the incorrect data type which should be rejected by a computer system **Substantive** Practical experience of designing input validation and simple authentication (e.g. username and password) Ability to identify suitable test data for a given scenario Ability to create/complete a test plan	procedures effectively The use of the following within functions and procedures: local variables/constants global variables/constants arrays (passing and returning) SQL commands: SELECT FROM WHERE Be able to create and use random numbers in a program **Disciplinary** Ability to choose suitable data types for data in a given scenario High level code created for given scenarios **Literacy** Comment Assignment Constants Global Variables Input Output Casting	Identify an algorithm if given the code or pseudocode for it **Disciplinary** Able to create more complex diagrams for problems **Literacy** Algorithm, Pseudocode, Abstraction, Decomposition, Algorithmic thinking, Pattern recognition, Logic and Syntax errors, Trace table, Binary search, Linear search, Bubble sort, Merge sort, Insertion sort.		

	String High level Language Low level Language Machine Code Assembly language Interpreter Compiler Integrated Development Environmental (IDE) Debugging Syntax	**Literacy** Comment Assignment Constants Global Variables Input Output Casting Iteration Selection String Length Substrings Concatenation ASCII File Handling Arrays Procedure Function Random Float Real Integer Character String Authentication Validation Presence, Range, Length check Maintainability, comments, naming conventions, indentation Testing	Iteration Selection String Length Substrings Concatenation ASCII File Handling Arrays Procedure Function Random Float Real Integer Character String Programming constructs, Sequence, Selection and Iteration Data types String manipulation, substrings, upper and lower File handling read write append Subprograms Functions Procedures Arrays 1D 2D SQL Commands Select From Where Database			

WJEC Level 1/2 Vocational Award ICT (Technical Award) Curriculum Map

Year 10				
2.4 PLANNING, CREATING, MANIPULATING AND STORING IMAGES	2.1 PLANNING, CREATING, MODIFYING AND USING A DATABASE	2.2 PLANNING, CREATING, MODIFYING AND USING A SPREADSHEET	2.3 PLANNING, CREATING AND MODIFYING AN AUTOMATED DOCUMENT	**Controlled Assessment** Started in May of Year 10 60% of overall grade. Completed CA hand in November of year 11. Assignment structured on a business scenario set by WJEC. Students to use knowledge and technical skills learnt to complete tasks and meet the client brief.
Rationale- Beginning the course with image manipulation will give students an engaging start to the WJEC course. Students to develop their ability to generate digital graphics through photoshop. Pupils to analyse project requirements and create graphics for a coursework scenario. In the controlled assessment, WJEC recommend to begin with digital graphics to then incorporate throughout the project. **Substantive**- Plan and design an image in response to the client brief.	**Rationale**- Next databases will follow, teaching students how to import and manipulate data Microsoft access. All aspects of creating databases will be covered at this point, therefore they can be created independently in the controlled assessment. **Substantive**- Plan and design a database in response to the client brief. Create and modify your database according to your planning and design Interrogate your database Create a user interface for your database. Test and evaluate your database.	**Rationale**- Spreadsheets will follow, teaching students how to import and manipulate data using Microsoft excel. All aspects of creating spreadsheets will be covered at this point, therefore they can be created independently in the controlled assessment. **Substantive**- Plan and design a spreadsheet in response to the client brief. Create and format your spreadsheet according to your planning and design. Make use of appropriate data formatting and add suitable validation rules.	**Rationale**- Automated documents will follow, developing students' knowledge and skills using Microsoft word, publisher and PowerPoint. Students to incorporate data from 2.1 and 2.2. to produce a mail merged document. Software skills developed to allow pupils to complete the client brief and scenario. **Substantive**- How to use headers, footers and watermarks, how to set up tables of contents and use headings, how to perform a mail merge, how to use document reviewing, how to create master slides, speaker notes, linear and	

Create and modify an image using appropriate tools and techniques. Store the image appropriately and output the final image in a format that is fit for purpose. **Disciplinary**- Generating an appropriate digital graphic for a business coursework scenario. Evaluation of work, identify strengths and weaknesses to make improvements. Combining different pieces of software to produce an effective digital graphic. **Literacy**- Colour theory, shapes, symbols, typography, properties, bitmap, vector, visualisation, purpose, layout, sourcing, asset, client, canvas, adjustments, Brightness/Contrast, Levels, Curves, Exposure, Vibrance, Hue/Saturation,	How to create flat file databases and relational databases, how to create data entry forms, how to create queries, how to create reports, how to create a switchboard and how to apply database security. **Disciplinary**- Using skills taught for databases, apply these skills to a given scenario. Make informed decisions about the type of software to use. Import data into access and be able to effectively manipulate data to meet a client's requirements. Evaluation of work, identify strengths and weaknesses to make improvements. **Literacy**- Import, relationship, interrogation, data, primary key, foreign key, table, record, field,	Use appropriate formulae and functions to meet the outcomes set in the brief. Arrange, reduce and output data to help make decisions. Modify data and formulae to model 'what if' scenarios. Test and evaluate your spreadsheet. How to use absolute cell referencing and relative cell referencing, how to perform cross worksheet integration, how to create charts, tables and graphs, how to perform 'What If' analysis, how to apply spreadsheet security. **Disciplinary**- Using skills taught for spreadsheets, apply these skills to a given scenario. Make informed decisions about the type of software to use. Import data into	non-linear presentations, how to embed data. Create a automated document appropriate for the client brief. **Disciplinary**- Apply knowledge to a given scenario to create 'automated documents'. Be able to select appropriate software to complete a task, applying skills learnt in a range of software programs. Incorporate prior units 2.4, 2.1 and 2.2. **Literacy**- Footnote, Endnote, Caption, Content table, Index, Watermark, Section, Header, Footer, Track changes, Security, House style, CSV file, Index, Resources, Integrated Document.	

Colour Balance, Black & White.	validation, verification, security.	excel and be able to effectively manipulate data to meet a client's requirements. Evaluation of work, identify strengths and weaknesses to make improvements. **Literacy**- Data, formatting, conditional formatting, validation, format, formula, function, input, output, sort, filter, complex functions, testing, valid, extreme, erroneous.		

Year 11				
Controlled Assessment Started in May of Year 10 60% of overall grade. Completed CA hand in November of year 11. Assignment structured on a business scenario set by WJEC. Students to use	1.1 How IT can be used to fulfil the needs of organisations and individuals	1.2 How data and information is used and transferred	1.3 Legal, moral, ethical, cultural and environmental impacts of IT and the need for cybersecurity	**Written Exam** "ICT in Society" On screen exam. 80 marks 120 minutes. 40% of final grade.
	Rationale- Once the controlled assessment is complete 1.1 will be underway. In preparation for the exam, students will learn how IT	**Rationale**- 1.2 will follow. Students will be taught how data and information is used and transferred. Learning knowledge of how ICT in	**Rationale**- 1.3 will be the final taught unit of work, leading up to the exam. Making sure students understand Legal, moral, ethical, cultural and	

knowledge and technical skills learnt to complete tasks and meet the client brief.	can be used to fulfil the needs of organisations and individuals. **Substantive**- Functionality of different hardware devices. Functionality of different Software. Services provided by IT. **Disciplinary**- Using knowledge of hardware and software and link with services IT can provide to businesses and organisations. Be able to categorise, describe and apply knowledge to specific uses. Make comparisons between uses of IT. Describe the features and uses of different hardware, software and services provided. Complete extended pieces of writing on the benefits and drawbacks of the use of IT in society.	society uses data and information. **Substantive**- Why data must be fit for purpose. How input data is checked for errors. How data transfers over different types of network. Different types of connectivity. **Disciplinary**- Using knowledge of data and information to identify advantages and disadvantages of data being fit for purpose. Applying knowledge of data methods used for validation and verification and their appropriateness, linked to scenarios. Comparisons between different networks and their uses in society. Applying knowledge of connection methods to	environmental impacts of IT and the need for Cybersecurity. **Substantive**- Risks to information held on computers. The impact of data loss, theft or manipulation on individuals and businesses. Methods used to protect Information. How moral and ethical issues affect computer users. How legal issues protect computer users. The cultural, personal and environmental impact of ICT. How a digital footprint can impact computer users. **Disciplinary**- Select and justify appropriate risks to computer systems in a given context. Evaluate the impact of data loss,	

	Literacy- Devices, input, output, storage, components, ports, system, software, hardware, communication, capture, manipulation, networking, control processes, artificial intelligence, security systems.	society and everyday personal technology uses. **Literacy**- Data, information, processed, communication, compression, properties, capture methods, validation and verification, sources, errors, networks, protocols, topologies, internet, extranet, intranet, connection, communication, emerging technologies.	theft or manipulation on individuals and businesses. Advantages and disadvantages of methods used to protect information. Building on your knowledge of society how do legal, ethical and moral issues impact the use of technology and IT. Apply knowledge of culture, personal, and environmental impacts of ICT on given scenarios. **Literacy**- Malware, Encryption, Vulnerabilities, Access Rights, Defamation of character, Password, Public authorities, Risk, Risk Mitigation. Digital footprint, identity,	

Time Scale Overview

Unit 2 controlled assignment release May.

Year 1 (Year 10)					
Autumn			**Spring**		**Summer**
2.4	2.1	2.2	2.3	Controlled Assessment Practice (previous years assignment)	Unit 2 Controlled Assessment

Year 2 (Year 11)				
Autumn		**Spring**		**Summer**
Unit 2 Controlled Assessment	1.1	1.2	1.3	Unit 1 Exam Preparation