Computing Life After Levels

Level			Knowledge – I know …	Understanding – I understand …	Create and Implement – I can …	Analyse and Evaluate – I can …
		9				
	9	8				
9	8	7		• How to represent Boolean logic using truth tables	• Practical experience of a small (hypothetical) low level programming language • Write functions to perform a task/improve a program	
8	7	6	• How to perform bit pattern conversions such as binary addition/subtraction and converting binary to hexadecimal • What Moore's law is and why it is important	• Understand the need for data compression and how to perform this • How multitasking takes place in a computer and why this is a benefit	• Make use of a loop counter when using a FOR loop • Create programs that enforce reusability • Make use of appropriate data structures (e.g. lists, tables or arrays)	• How to evaluate the effectiveness of an algorithm • Different types of testing such as normal, erroneous and boundary
7	6	5	• That designing an algorithm does not directly relate to a specific programming language • The relationship between data representation and data quality • That processors have their own set of instructions (instruction sets) and these relate to a low level language • How different hardware/software components communicate with one another	• That a variable can either be local or public, and what this means in relation to its use • Boolean logic gates such as AND, OR, NOT and how they work • A basic understanding of the client – server model • How to plan, use and evaluate a computational idea which models the state and behaviour of real world problems and physical systems	• Can make use of While and Until loops • Create my own simple logic gate circuit based on a problem • Collect and analyse data to meet the needs of known users	• How to evaluate the effectiveness of an algorithm • Apply a modular approach to error detection and correction • How to present test data using the 'expected' and 'actual' outcome approach • Consider the design and usability of a product for a specific target audience
6	5	4	• The differences between different procedures and functions • What a low level and high level language is • How to change binary into ASCII	• That recursion (repetition) can be applied to smaller instances of a problem • Some problems share the same characteristics and therefore can use the same solution to solve them (generalisation) • That although solutions can be completed in different ways, some are more effective than others • What a character set is and how it can be used for sound, images and numbers • The relationship between resolution and colour depth, and how these can affect file size • The von-Neumann architecture in relation to the Fetch – Execute cycle • That some problems cannot be solved using a computer	• Use different/appropriate procedures and functions • Use nested statements (e.g. nested Ifs) • Perform simple operations using bit patterns (e.g. binary addition)	• Detect and correct syntactical errors • Test a program against test that I have created
5	4	3	• Two or more programming languages (at least one being textural) • Different data types, such as real numbers or Boolean • That binary is the way digital computers represent all data • The main parts of computer architecture and what they do • How search engines rank results	• That iteration is the repetition of a process such as a loop • That programming allows us to create solutions using technology and its importance • How numbers and images are represented in a computer (bit patterns) • How compression affects the size of a file • The basics behind the fetch-execute cycle • That data transmitted between computers uses networks (including the internet)	• Select the appropriate data types for a task • Represent a solution using a structured design/diagram • Use a high level text based language • How to create a basic website using HTML and CSS • Know a range of operators and expression and use them (e.g. +, -, * , /)	• Recognise similarities and differences in situations and use these to solve problems (pattern recognition)
4	3	2	• How to make use of procedures to complete tasks, even if I don't fully understand why (procedural abstraction) • Why and when computers would be best used to complete a task • How search engine results are selected and chosen	• That some tasks are better completed by humans, whereas some better by computers • That multiple solutions may exist for the same problem • When it is best to use and apply IF, THEN and ELSE statements • The main purpose and functions of an operating system	• Use search engines effectively to find suitable data • Use UNTIL loops in a program • Use IF, THEN and ELSE statements in a program • Use variable(s) and a loop(s) to manage when a section of code should end (e.g. when lives = 0) • How to create a basic website using HTML	• Break a problem down into smaller, manageable chunks (decomposing) • Discuss and explain my decisions and suggest alternatives for next time
3	2	1	That computers collection data from a range of places, like input devices and application software	• The different between hardware and software, and their roles within the computer	• Create an algorithm that makes use of repetition (loops) and two way selection (IF, THEN, ELSE)	• Predict outcomes based on logical thinking and considering inputs

			I Know	I Understand	ICT/Digital Skills	Digital Literacy
				• The difference between the Internet and internet services (e.g. the WWW) • How to break a problem down and solve it in smaller chunks	• Create a program to achieve a goal • Declare and assign variables	
2	1		• That a range of digital devices can be considered computers • A range and purposes of input and output devices	• That different programs have different purposes on a general purpose computer	• Create a simple algorithm using loops and IF statements (selection) • Explain how a simple algorithm works	• Predict outcomes based on logical thinking • Detect/correct errors to make a program better
1			• That all software is programmed • That computers run by following precise instructions • Common uses of computers beyond school	• That all software is programmed • That computers run by following precise instructions • Common uses of computers beyond school	• I can create my own simple program (none text based)	• I can run my program, check it and change it to make it better • Plan a simple idea which I intend to create

ICT Life After Levels

Level			I Know	I Understand	ICT/Digital Skills	Digital Literacy
9	8	7		•	•	
8	7	6	• How to identify and choose the most suitable media for a digital product • What a relational database is and the benefits of storing data in multiple tables	• The hardware associated with networking computer systems including LANS and WANS • What a MAC address is and why it is useful		Understands the various legal frameworks that exist within ICT and Computing such as the DPA, CMA and CDPA
7	6	5	The purpose of the hardware and protocols associated with networking computer systems	• The properties of media when importing them into digital artefacts	• Can undertake a creative project that collects, analyses and evaluates data to meet the needs to users • Effectively designs and creates digital artefacts for a chosen audience • Can document user feedback and evidence any improvements made • Can make use of a range of different application software to perform a task	• Can undertake a creative project that collects, analyses and evaluates data to meet the needs to users • Effectively designs and creates digital artefacts for a chosen audience • Can document user feedback and evidence any improvements made • Can make use of a range of different application software to perform a task
6	5	4	• The name of various types of hardware associated with networking computer systems (e.g. .hubs, routers, switches and protcols)	How to evaluate the trustworthiness of digital content	• Can justify my choices and independently combines multiple digital devices, internet services and application software to achieve a goal • Considers how visual design features can and create digital artefacts for a known audience • Can design criteria for users to evaluate the quality of a product/solution • Uses feedback from a user to identify improvements and makes appropriate changes	• Uses technologies and online services securely • Knows how to identify and report inappropriate conduct • Can identify and explain how the use of technology can impact on society
5	4	3	• That there is a range of operating systems and application software for the same hardware	• How to design criteria to critically evaluate the quality of a solution	• How to query data on one table	Recognises ethical issues surrounding the application of information technology beyond school

				• How to use the criteria to make appropriate changes	• Can evaluate the appropriateness of software/device/internet service choice to achieve a goal • How to evaluate and choose an appropriate piece of software to perform a task	
4	3	2	The difference between physical, wireless and mobile networks	• That poor quality data leads to unreliable results and inaccurate conclusions • How to recognise the audience when creating digital content	• Can perform more complex searches for information (e.g. Using Boolean and relational operators) • Can analyse and evaluate data • Can use criteria to evaluate the quality of solutions and how to identify improvements, making some refinements to the solutions	• Makes judgements about digital content when evaluating and repurposing if for an audience • Can demonstrate reasonable use of technologies and online services • Knows a range of ways to report concerns • Understands the potential of information technology for collaboration when computers are networked
3	2	1	• The difference between data and information • A range of internet services (e.g. VOIP)	That using a flat file can improve searching of information	• Can use filters to help search for information • Can use single criteria queries to search for information • Can collect, organise and present data and information in digital content • Create digital content to achieve a given goal • Combine a range of software packages and internet services to communicate with wider audiences (e.g. blogging) • Can make appropriate improvements based on feedback and comment on the success of the solution	Recognises what is acceptable and unacceptable behaviour when using technologies and online services
2	1		• How to recognise different types of data (text, number) • A range of digital devices can be considered computers • A range of input and output devices	• Data can be structured in tables to make it useful • That programs can work with different types of data	• Can navigate the web and carry out simple web searches to collect digital content • Can use technology with increasing independence to organise digital content • Can use a variety of software to change and present digital content (data and information) • Can talk about completed work and can make improvements based on feedback	• Demonstrates use of computers safely and responsibly, knowing a range of ways to report unacceptable content and contact when online • Shows an awareness of the quality of digital content collected
1			• What makes an appropriate file/folder name • That people interact with computers	• Digital content can be represented in many different ways • How digital content can be used to represent information	• Obtain content from the world wide web using a web browser • How to create an appropriate file structure	• I understand the importance of communicating safely and respectfully online • I know that information should be kept private

			Common uses of information technology beyond the classroom				How to create, store and edit digital content	What to do if I am concerned about being contacted

Schemes of learning – **2016 onwards**

Term	Year 7	ICTM	COMPM	Year 8	ICTM	COMPM	Year 9	ICTM	COMPM	Year 9 Option	ICTM	COMPM
1	ICT 101 – Introduction Skills	IC1K IC1U IC1S		Graphics and images representation	IC1S IC3S	CO5U CO6U	E-safety Project	IC1D IC2S IC2D IC3S IC3D IC4D IC5S IC5D IC6U IC6S IC6D IC7S IC8K		Advanced Video Editing Intermediate Python	IC3S IC7K	CO1K CO1U CO1S C01A C02S C02A CO3U CO4U CO4A CO5K CO5S CO6K CO6U CO6S CO6A CO7U CO7A CO8S CO8A
2	Introduction to programming – Scratch		CO1K CO1U CO1S C01A C02S C02A CO3U C03S C04S				ICT Vs Computing	IC2K IC4K IC4D IC5K IC6K	C02K C02S C02A CO3U CO3K CO5K CO5U CO6K CO6U CO6S CO7K CO7U CO7S CO8K CO9U	Database Project Computing Concepts	IC2U IC3K IC4K IC4U IC5K IC5S IC6K IC7K IC8K IC8U	CO3U CO3K CO5K CO5U CO6K CO6K CO6U CO6S CO7K CO7S CO7A CO8K CO8U CO9U CO9S
3	E-safety	IC1D IC2S IC2D IC3D IC4D IC6U IC6D		Introduction to Python	IC4S	CO1K C01D C02S C02A CO3U C03S CO4U CO4A C04S CO5K CO5S CO6A CO7A	Music Project	IC2S IC3S IC7K	CO5S	Introduction to Photography Visual Basic	IC1S IC3S	CO1K CO1U CO3U C03S CO4U CO4A CO5K CO4S CO5S CO6K CO6U CO6A CO7U CO7A CO8S CO8A

#	Unit	IC	CO	Unit	IC	CO	Unit	IC	CO	Unit	IC	CO
4	Spreadsheets and Modelling	IC2K IC3S IC4S					App Development	IC4S		Advanced Scratch Project	IC5U IC6S IC7S	CO1K CO1U CO1S C01A C02S C02A CO5K CO5S CO6S CO6A CO7U CO7A CO8S CO8A
5	Computing Theory	IC2K	CO1K C02K C02U C02A CO3U CO3K	Theme Park Project	IC2S IC3S IC5U IC5S IC6S IC7S IC8K	CO4A CO5S CO7U	HTML Web Design/The Internet	IC2S IC3K IC4S IC4D	CO1K C04S CO5K CO5S	Javascript Controversies in Computer Science	IC5D IC6D	CO5S CO6U CO6S
6	Programming Scratch Project	IC4S IC5U IC5S IC6S	CO1K CO1S C01A C02S C02A CO3U C03S CO4A C04S CO5S CO6A CO7A				The Apprentice	IC3S IC5U IC5S IC6S IC7S IC8K		Dabble		

Missing IC8D