

# ICT Assessment Levels

I can do this	9=	8+	8=	8-	7+	7=	7-	6+	6=	6-	5+	5=	5-	4+	4=	4-	3+	3=	3-	2+	2=	2-	1+	1=	1-	F+	F=	F-
<b>Algorithms</b>	I can design a range of solutions to a problem that depends on solutions to smaller instances of the same problem (recursion). I can explain why some problems cannot be solved computationally.	I can design a solution to a problem that depends on solutions to smaller instances of the same problem (recursion). I know that some problems cannot be solved computationally.	Can adapt skills, techniques and ideas to new situations with ease. Shows consistent precision, control and fluency.	I know a repeating solution to a problem applies the same solution to smaller instances of the problem (recursion). I know that for some problems I can share the same characteristics and use the same algorithm to solve both (generalisation). I can explain why some algorithms are better than others for the same problem.	I know that iteration is the repetition of a process such as a loop. I know that different algorithms exist for the same problem. I can represent solutions using a structured notation (flow chart/pseudocode). I can identify similarities and differences in situations and can use these to solve problems (pattern recognition).	I show an awareness of tasks best completed by humans or computers. I can design solutions by decomposing a problem and create a sub-solution for each of these parts (decomposition) (eat my elephant in little chunks). I know that different solutions exist for the same problem.	I can design solutions (algorithms) that use repetition and two-way selection i.e. if, then and else. I can use diagrams to express solutions. I can use logical reasoning to predict outputs, showing an awareness of inputs.	I know that algorithms are implemented on digital devices as programs. I can design simple algorithms using loops, and selection i.e. if statements. I can use logical reasoning to predict outcomes. I can find and correct errors i.e. debugging, in algorithms.	I know what an algorithm is and I can express simple algorithms using symbols. I know that computers need precise instructions. I show care and precision to avoid errors.	I know what an algorithm is and I can express simple instructions. I try to work with care to avoid errors. I can express simple instructions. I know that computers need operators. I try to work with carefully																		
<b>Programming and Development</b>	I can design and write effective nested modular programs that enforce reusability utilising sub-routines wherever possible. I can appropriately use 'While' loop and 'For' loop, which I can use a loop counter. I know and I can use two dimensional data structures effectively.	I can design and write nested modular programs that enforce reusability utilising sub-routines wherever possible. I know the difference between 'While' loop and 'For' loop, which I can use a loop counter. I know and I can use two dimensional data structures.	I know the effect of the scope of a variable e.g. a local variable can't be accessed from outside its function. I know and apply parameter passing. I know the difference between, and I can use, both pre-tested e.g. 'while', and post-tested e.g. 'until' loops. I can apply a modular approach to error detection and correction.	I can use nested selection statements. I know the need for, and can write, custom functions including use of parameters. I know the difference between, and I can use appropriately, procedures and functions. I know and I can use negation with operators. I can use and manipulate one dimensional data structures. I can find and correct syntactical errors.	I know that programming bridges the gap between algorithmic solutions and computers. I have practical experience of a high-level textual language, including using standard libraries when programming. I can use a range of operators and expressions e.g. Boolean, and applies them in the context of program control. I can select the appropriate data types.	I know the difference between, and can appropriately use if and if, then and else statements. I can use a variable and relational operators within a loop to govern termination. I can design, write and debug modular programs using procedures. I know that a procedure can be used to hide the detail with sub-solutions (procedural abstraction).	I can create programs that implement algorithms to achieve given goals. I can declare (name) and assign variables. I can use post-tested loops e.g. 'until', and a sequence of selection statements in programs, including an if, then and else statement.	I can use arithmetic operators, if statements, and loops, within programs. I can use logical reasoning to predict the behaviour of programs. I can find and correct simple semantic errors i.e. debugging, in programs	I know that users can write their own programs. I can create a simple program. I can run, check and change programs. I know that programs run by following precise instructions.	I can create simple programmes. I can express simple programmes. I can predict behaviour of simple programmes. I can create simple instructions. I can debug simple instructions.																		
<b>Data and Data Representation</b>	I can perform operations using bit patterns e.g. conversion between binary, binary and hexadecimal, binary mathematical operations. I know and can explain the need for data compression, and performs complex compression methods. I can create an effective relational database, and I know the benefits of storing data in multiple tables and can explain this.	I can perform operations using bit patterns e.g. conversion between binary and hexadecimal, binary subtraction etc. I know and can explain the need for data compression, and performs simple compression methods. I know what a relational database is, and I know the benefits of storing data in multiple tables.	I know the relationship between data representation and data quality. I know the relationship between binary and electrical circuits, including Boolean logic. I know how and why values are data type in many different languages when manipulated within programs (e.g. Real Number in Access, Float in Python).	I know how numbers, images, sounds and character sets use the same bit patterns. I can perform simple operations using bit patterns e.g. binary addition. I know the relationship between resolution and colour depth, including the effect on file size. I can distinguish between data used in a simple program (a variable) and the storage structure for that data (file extensions).	I know that digital computers use binary to represent all data. I know how bit patterns represent numbers and images. I know that computers transfer data in binary. I know the relationship between binary and file size (uncompressed). I can define data types: real numbers and Boolean. I can query data on one table using a typical query language.	I can perform more complex searches for information e.g. using Boolean and relational operators. I can analyse and evaluate data and information, and I know that poor quality data leads to unreliable results, and inaccurate conclusions.	I know the difference between data and information. I know why sorting data in a flat file can improve searching for information. I can use filters or can perform single criteria searches for information.	I know different types of data: text, number. I know that programs can work with different types of data. I know that data can be structured in tables to make it useful.	I know that digital content can be represented in many forms. E.g. images, text, sound. I know the difference between some of these digital forms and can explain the different ways that they communicate information.	I can use the appropriate type of data. I know different types of data (images, text)																		
<b>Information Technology</b>	I know the ethical issues surrounding the application of information technology, an existence of legal frameworks governing its use e.g. Data Protection Act, Computer Misuse Copyright etc., and how this can be applied in organisations and understand the effects on society.	I know the ethical issues surrounding the application of information technology, an existence of legal frameworks governing its use e.g. Data Protection Act, Computer Misuse Copyright etc.	I can undertake creative projects that collect, analyse, and evaluate data to meet the needs of a known user group. I can effectively design and create digital artefacts for a wider or remote audience. I consider the properties of media when importing them into digital artefacts. I can document user feedback, the improvements identified and the refinements made to the solution. I can explain and justify how the use of technology impacts on society, from the perspective of social, economical, political legal, ethical and moral issues.	I can justify the choice of and independently combine and I use multiple digital devices, internet services and application software to achieve given goals. I can design criteria for users to evaluate the quality of solutions, and can use the feedback from users to identify improvements and can make appropriate refinements to the solution. I can identify and explain how the use of technology can impact on society.	I can evaluate the appropriateness of digital devices, internet services and application software to achieve given goals. I can recognise ethical issues surrounding the application of information technology beyond school. I can design criteria to critically evaluate the quality of solutions. I can use the criteria to identify improvements and can make appropriate refinements to the solution.	I can make judgements about digital content when evaluating and repurposing it for a given audience. I know the audience when I am designing and creating digital content. I know the potential of information technology for collaboration when computers are networked. I can use criteria to evaluate the quality of solutions and can identify improvements making some refinements to the solution, and future solutions.	I can collect, organise and present data and information in digital content. I can create digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience. I can make appropriate improvements to solutions based on feedback received, and can comment on the success of the solution.	I can use technology with increasing independence to purposefully organise digital content. I can show an awareness for the quality of digital content collected. I can use a variety of software to manipulate and present digital content and information. I can share my experiences of technology in school and beyond the classroom. I can talk about my work and make improvements to solutions based on feedback received.	I can use software with guidance to create, store and edit digital content using appropriate folder structures. I can share my use of technology in school. I know common uses of information technology beyond the classroom. I can talk about my work and make changes to improve it.	I can save my work logically. I can use a variety of software for different purposes. I can save my work. I can use ICT in and outside of school.																		
<b>Hardware and Processing</b>	I have practical experience of a (hypothetical) low level programming language (machine code). I know and can explain Moore's Law in detail. I know and can explain the advantages and disadvantages of multitasking by computers.	I have practical experience of a small (hypothetical) low level programming language (machine code). I know and can explain Moore's Law. I know and can explain multitasking by computers.	I know that processors have instruction sets and that these relate to low-level instructions carried out by a computer.	I know the von Neumann architecture in relation to the fetch-execute cycle, including how data is stored in memory. I know the basic function and operation of location addressable memory.	I know the function of the main internal parts of basic computer architecture. I know the concepts behind the fetch-execute cycle. I know that there is a range of operating systems and application software for the same hardware.	I can give examples of why and when computers are used. I know the main functions of the operating system. I know the difference between physical, wireless and mobile networks.	I know that computers collect data from various input devices, including sensors and application software. I know the difference between hardware and application software, and their roles within a computer system.	I know that a range of digital devices can be considered a computer e.g. microwaves, tablets, phones etc. I know and can use a range of input and output devices. I know different software packages are appropriate for different purposes, e.g. Excel for Spreadsheets, Adobe Photoshop for photo editing	I know that computers have no intelligence and that computers can do nothing unless a program is run. I know that all software executed on digital devices is programmed.	I know computers can only run with programmes. I know computers need logical instructions.																		
<b>Communication and Networks</b>	I can explain in detail the hardware associated with networking computer systems, including WANs and LANs. I understand and can explain their purpose and how they work, including MAC addresses.	I know the hardware associated with networking computer systems, including WANs and LANs. I know their purpose and how they work, including MAC addresses.	I know the purpose of the hardware and protocols associated with networking computer systems. I know the client-server model including how dynamic web pages use server-side scripting and that web servers process and store data entered by users. I know that persistence of data on the internet requires careful protection of online identity and privacy.	I know names of hardware e.g. hubs, routers, switches, and the names of protocols e.g. SMTP, IMAP, POP, FTP, TCP/IP, associated with networking systems. I can use technologies and online services securely, and I know how to identify and report inappropriate conduct.	I know how search engines rank search results. I know how to construct static web pages using HTML and CSS. I know how data is transmitted between digital computers over networks, including the internet i.e. IP addresses and packet switching.	I know how to effectively use search engines, and I know how search results are selected, including the use of 'web crawler programs' by search engines. I can select, combine and use internet services e.g. E-mail, Skype, Messenger. I can show responsible use of technologies and online services, and I know a range of ways to report concerns.	I can navigate the web and can carry out simple web searches to collect digital content. I can show use of computers safely and responsibly, knowing a range of ways to report unacceptable content and contact when online.	I can find content from the World Wide Web using a web browser. I know the importance of communicating safely and respectfully online, and the need for keeping personal information private. I know what to do when concerned about content or being contacted.	I understand acceptable behaviour on the computer and ways to report concerns. I understand that I must keep my personal information safe. I know I must use the internet safely. I know I have to keep my information safe.																			