KS3 Computing Assessment grids The statements used represent the intended skills, knowledge and understanding covered at KS3 as KE Aston. KS3 Computing encompasses six main concepts and is taught incrementally from year 7 to year 9. To reach a KS3 Curriculum Assessment Grade, a holistic view of the pupil's progress is considered.

7	8	9	Algorithms and computational thinking	Programming & Development	Data & Data Representation	Hardware & Processing	Communication & Networks	Computer systems and technology in wider context
		M+	• Know that the design of an algorithm is distinct from its expression in a programming language (which will depend on the programming constructs available). • Can evaluate the effectiveness of algorithms and models for similar problems. • Can use logical reasoning to explain how an algorithm works. • Can represent algorithms using a structured language.	• Can design and write nested modular programs that enforce reusability utilizing sub-routines wherever possible. • Know the difference between various selection and iteration constructs and can use these depending on the problem. • Know and can use various data structures. Can apply modular approach to error detection and correction.	• Can perform operations using bit patterns e.g. conversion between binary and hexadecimal, binary addition, shifts with accuracy. • Know and can explain the need for data compression and performs simple compression methods. • Know the advantages and limitation of flat files and relational databases	˙know that processors have instruction sets and that these relate to low-level instructions carried out by a computer.	• I know the purpose of the hardware and protocols associated with networking computer systems. • 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 that persistence of data on the internet requires careful protection of online identity and privacy.	• Can undertake creative projects that collect, analyse, and evaluate data to meet the needs of a known user group. • Can effectively design and create digital artefacts for a wider or remote audience. • Consider the properties of media when importing them into digital artefacts. • Can document user feedback, the improvements identified and the refinements made to the solution. • Know the social, ethical and moral issues surrounding the application of information technology, an existence of legal frameworks governing its use.
		M	• Know the notion of performance for algorithms and I know that some algorithms have different performance characteristics for the same task.	• Know the reasons for choosing a particular data type over other data types.	• Able to use various data analysis tools available in software to present and analyse data effectively. • know what a relational database is, and I know the benefits of storing data in multiple tables.	• Understand how hardware has evolved overtime.	• Understand limitations and advantages of online services. • I can use technologies and online services securely.	• Can identify and explain how the use of technology can impact on society.

M	**S**		• know that for some problems, same characteristics and use the same algorithm	• I can use and manipulate one dimensional data structures like arrays and lists • I can find and corrects syntactical errors.	• 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.	• Know the computer hardware required for building computer networks	Know suitability, advantages and limitations of various network types.	• Can evaluate the trustworthiness of digital content and consider the usability of visual design features when designing and creating digital artefacts for known audience.
M	**S**	**D**	• Understand that a sub program/algorithm can be applied repeatedly to smaller instances of the problem.	• I can use nested selection and iteration statements. • I know the need for, and can write, custom functions including use of parameters.	• Know how numbers, images, sounds and character sets use the same bit patterns. • Can perform simple operations using bit patterns e.g. binary addition and number system conversions	• Know the function of the main internal parts of basic computer architecture.	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.	• Can justify the choice of and independently combine and I use multiple digital devices, internet services and application software to achieve given goals.
S	**D**		• Able to use iteration and selection technique in their solutions with confidence. • I know that different algorithms exist for the same problem. • I can identify similarities and differences in situations and can use these to solve problems (pattern recognition).	• Know that programming bridges the gap between algorithmic solutions and computers. • Can program in at least one visual and one textual highlevel textual language, including using standard libraries when programming. • Know that programming constructs have different syntax in different high-level languages. • Can use a range of operators and expressions e.g. Boolean, and applies them in the context of program control. • Can select the	• 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 can define data types: integer, real, character, string, boolean, date, currency. • I can query data on one table using a typical query language. • I can perform more	• I know the difference between physical, wireless and mobile networks. • I know and can explain Moore's Law	• I know how to construct static web pages using HTML • I know data transmission between digital computers over networks, including the internet i.e. IP addresses and packet switching. • I can use technologies and online services securely, and I know how to identify and report inappropriate. conduct. • Can explain advantages and limitations of computer networks. • Know that computer networks can be	• Can evaluate the appropriateness of digital devices, internet services and application software to achieve given goals. • Can recognize ethical issues surrounding the application of information technology beyond school. • Can use the criteria to identify improvements and can make appropriate refinements to the solution

					appropriate data types.	complex searches for information e.g. using Boolean and relational operators. • Able to a range of tools available in software to present and analyse data appropriately		classified into various types: wired and wireless, LAN and WAN; Client server and Peer to peer	
D			• Show an awareness of tasks best completed by humans or computers. • Know that iteration is the repetition of a process such as a loop. • Know selection is choosing an execution path based on a condition. • Can design solutions by decomposing a problem and creates a sub solution for each of these parts (decomposition). • Know that different solutions exist for the same problem. • Can design solutions (algorithms) that use repetition and two-way selection i.e. if, then and else. • Can use diagrams to express solutions if needed • Can use logical reasoning to predict outputs, showing an awareness of inputs.	• Can use various selection and iteration constructs whilst programming. • Can use variable and relational operators within a loop to govern termination. • Can design, write and debug modular programs using procedures. • Know that a procedure can be used to hide the detail with sub solution (procedural abstraction). • Can create programs that implement algorithms to achieve given goals. • Can declare and assign variables. • Can use some selection and iteration constructs. • Can use arithmetic and relational operators, if statements and forever loops within programs. • Can use logical reasoning to predict the behavior of programs. • Can find and correct simple semantic	• Can perform searches for information using multiple criteria. • Able to use tools available in software to present and analyse data appropriately. • Analyses and evaluates data and information, and I know that poor quality data leads to unreliable results, and inaccurate conclusions. • Know the difference between data and information. • Can use filters or can perform single criteria searches for information. • Know that different programs can be used to store, process and analyse data. • Know that programs can work with different types of data.	• Know the difference between the internet and internet service e.g. world wide web. • Selects, combines, and can use internet services. • Show responsible use of technologies and online services and know a range of ways to report concerns. • Know that computers collect data from various input devices, including sensors and application software. • Know that computers provide output data through various devices including printer, speaker, data files and via actuators • Know that a range of digital devices can be considered a computer. • Know and can use a range of input and output devices. • Know that computers have no intelligence. and that computers can do nothing unless	• Know the difference between the internet and internet service e.g. world wide web. • Selects, combines and can use internet services. • Show responsible use of technologies and online services, and know a range of ways to report concerns. • Can show an awareness of, and can use a range of internet services like emails, cloud storage etc • Know what is acceptable and unacceptable behaviour when using technologies and online services. • Can use BSS computer network including office 365 online services effectively. • Can navigate the web and can carry out simple web searches to collect digital content. • Show use of computers safely and responsibly, knowing a range of ways	• Can make judgements about digital content when evaluating and repurposing it for a given audience. • Know the audience when I am designing and creating digital content. • Know the potential of information technology for collaboration when computers are networked. • Can use criteria to evaluate the quality of solutions and can identify some improvements and make refinements to the solution, and future solutions. • Can collect, organise and present data and information in digital content. • Can create digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience.

			• Know how to use programming tools to ensure that program code is annotated • Know that algorithms are implemented on digital devices as programs. • Can design simple algorithms using loops, and selection i.e. if statements. • Can use logical reasoning to predict outcomes. • Can find and correct errors i.e. debugging, in algorithms. • Know what an algorithm is and can express simple algorithms using symbols. • Know that computers need precise instructions. • Can show care and precision to avoid errors.	errors i.e. debugging, in programs. • Know that users can write their own programs. • Can create a simple program. • Can run, check and change programs. • Know that programs run by following precise instructions	• Know that data can be structured in tables to make it useful. • Know that digital content can be represented in many forms. • Know different types of data: text, number.	a program is run. • Know that computers need precise instructions. • Know that all software executed on digital devices is programmed.	to report unacceptable content and contact when online. • Know what to do when concerned about content or being contacted. • Know what a computer network is. • Understand that schools and other organisations have their computer networks. • Aware of BSS school network. • Can find content from the world wide web using a web browser. • Know the importance of communicating safely and respectfully online, and the need for keeping personal information private.	• Can make appropriate improvements to solutions based on feedback received, and can comment on the success of the solution. • Can use technology with increasing independence to purposefully organise digital content. • Can show an awareness for the quality of digital content collected. • Can use a variety of software to manipulate and present digital content: and information. • Can share my experiences of technology in school and beyond the classroom. • Can talk about my work and make improvements to solutions based on feedback received. • Can use software under the control of the teacher to create, store and edit digital content using appropriate file and folder names. • Can share my use of technology in school. I know common uses of information technology beyond the classroom. • Can talk about my work and make changes to improve it.