

Grade	Computer Science	Information Technology	Digital Literacy
5	<p>Designs a solution to a problem that depends on solutions to smaller instances of the same problem (recursion).</p> <p>Understands the difference between 'While' loop and 'For' loop, which uses a loop counter.</p> <p>Performs operations using bit patterns e.g. conversion between binary and hexadecimal, binary subtraction etc.</p> <p>Understands and can explain the need for data compression and performs simple compression methods.</p> <p>Understands and can explain multitasking by computers.</p>	<p>Knows what a relational database is and understands the benefits of storing data in multiple tables.</p> <p>Understands the hardware associated with networking computer systems, including WANs and LANs, understands their purpose and how they work, including MAC addresses.</p> <p>Considers the properties of media when importing them into digital artefacts.</p>	<p>Understands the ethical issues surrounding the application of information technology, and the existence of legal frameworks governing its use e.g. Data Protection Act, Computer Misuse Act, Copyright etc.</p>
4	<p>Evaluates the effectiveness of algorithms for similar problems.</p> <p>Uses logical reasoning to explain how an algorithm works.</p> <p>Knows the relationship between data representation and data quality.</p> <p>Understands how and why values are data typed in many different languages when manipulated within programs.</p> <p>Understands the client-server model including how dynamic web pages use server-side scripting and that web servers process and store data entered by users.</p>	<p>Undertakes creative projects that collect, analyse, and evaluate data to meet the needs of a known user group.</p> <p>Effectively designs and creates digital artefacts for a wider or remote audience.</p> <p>Documents user feedback, the improvements identified, and the refinements made to the solution.</p>	<p>Recognises that persistence of data on the internet requires careful protection of online identity and privacy.</p> <p>Explains and justifies how the use of technology impacts on society, from the perspective of social, economic, political, legal, ethical and moral issues.</p>

<p>3</p>	<p>Recognises that some problems share the same characteristics and use the same algorithm to solve both (generalisation).</p> <p>Uses nested selection statements.</p> <p>Detects and corrects syntactical errors.</p> <p>Understands how numbers, images, sounds and character sets use the same bit patterns. Performs simple operations using bit patterns e.g. binary addition.</p> <p>Understands the relationship between resolution and colour depth, including the effect on file size.</p> <p>Distinguishes between data used in a simple program (a variable) and the storage structure for that data.</p> <p>Understands the von Neumann architecture in relation to the fetch-execute cycle, including how data is stored in memory.</p> <p>Understands the basic function and operation of location addressable memory.</p>	<p>Knows the names of hardware e.g. hubs, routers, switches, and the names of protocols e.g. SMTP, iMAP, POP, FTP, TCP/IP, associated with networking computer systems.</p> <p>Justifies the choice of and independently combines and uses multiple digital devices, internet services and application software to achieve given goals.</p> <p>Evaluates the trustworthiness of digital content and considers the usability of visual design features when designing and creating digital artefacts for a known audience.</p> <p>Designs criteria for users to evaluate the quality of solutions, uses the feedback from the users to identify improvements and can make appropriate refinements to the solution.</p>	<p>Uses technologies and online services securely, and knows how to identify and report inappropriate conduct.</p>
<p>2</p>	<p>Recognises that different algorithms exist for the same problem.</p> <p>Can identify similarities and differences in situations and can use these to solve problems (pattern recognition).</p> <p>Has practical experience of a high-level textual language, including using standard libraries when programming.</p> <p>Knows that digital computers use binary to represent all data.</p> <p>Understands how search engines rank search results.</p> <p>Understands how to construct static web pages using HTML and CSS.</p>	<p>Knows that there is a range of operating systems and application software for the same hardware.</p> <p>Evaluates the appropriateness of digital devices, internet services and application software to achieve given goals.</p> <p>Uses filters or can perform single criteria searches for information.</p> <p>Designs criteria to critically evaluate the quality of solutions, uses the criteria to identify improvements and can make appropriate refinements to the solution.</p>	<p>Recognises ethical issues surrounding the application of information technology beyond school.</p> <p>Makes judgements about digital content when evaluating and repurposing it for a given audience.</p> <p>Demonstrates responsible use of technologies and online services and knows a range of ways to report concerns.</p>
<p>1</p>	<p>Shows an awareness of tasks best completed by humans or computers.</p> <p>Understands the main functions of the operating system.</p> <p>Understands how to effectively use search engines, and knows how search results are selected, including that search engines use 'web crawler' programs.</p>	<p>Shows an awareness of and can use a range of internet services.</p> <p>Collects, organises and presents data and information in digital content.</p> <p>Creates digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience.</p> <p>Makes appropriate improvements to solutions based on feedback received and can comment on the success of the solution.</p>	<p>Selects, combines and uses internet services.</p> <p>Recognises what is acceptable and unacceptable behaviour when using technologies and online services.</p>

<p>Gold</p>	<p>Knows that computers collect data from various input devices, including sensors and application software.</p> <p>Understands the difference between hardware and application software, and their roles within a computer system.</p> <p>Understands the difference between the internet and internet service e.g. world wide web.</p>	<p>Uses technology with increasing independence to purposefully organise digital content.</p> <p>Uses a variety of software to manipulate and present digital content: data and information.</p> <p>Shares their experiences of technology in school and beyond the classroom.</p> <p>Talks about their work and makes improvements to solutions based on feedback received.</p> <p>Recognises that data can be structured in tables to make it useful.</p>	<p>Demonstrates use of computers safely and responsibly, knowing a range of ways to report unacceptable content and contact when online.</p> <p>Shows an awareness for the quality of digital content collected.</p>
<p>Silver</p>	<p>Understands that algorithms are implemented on digital devices as programs. Designs simple algorithms using loops, and selection i.e. if statements. Uses logical reasoning to predict outcomes. Detects and corrects errors i.e. debugging, in algorithms.</p> <p>Recognises that a range of digital devices can be considered a computer.</p> <p>Recognises and can use a range of input and output devices. Understands how programs specify the function of a general-purpose computer.</p>	<p>Talks about their work and makes changes to improve it.</p> <p>Recognises different types of data: text, number.</p> <p>Appreciates that programs can work with different types of data.</p> <p>Recognises that a range of digital devices can be considered a computer.</p> <p>Recognises and can use a range of input and output devices. Navigates the web and can carry out simple web searches to collect digital content.</p>	<p>Knows common uses of information technology beyond the classroom.</p> <p>Shares their use of technology in school.</p>
<p>Bronze</p>	<p>Understands what an algorithm is and can express simple linear (non-branching) algorithms symbolically.</p> <p>Understands that computers need precise instructions.</p> <p>Knows that users can develop their own programs, and can demonstrate this by creating a simple program in an environment that does not rely on text e.g. Scratch etc.</p> <p>Recognises that all software executed on digital devices is programmed.</p>	<p>Recognises that digital content can be represented in many forms.</p> <p>Obtains content from the world wide web using a web browser.</p> <p>Uses software under the control of the teacher to create, store and edit digital content using appropriate file and folder names.</p> <p>Understands that people interact with computers.</p>	<p>Understands the importance of communicating safely and respectfully online, and the need for keeping personal information private.</p> <p>Knows what to do when concerned about content or being contacted by strangers online.</p>