

## Computing (Year 9)

	<b>Initial</b> – a student who is still initial will be able to partially meet some of the following with support:	<b>Emerging</b> – a student whose understanding is still emerging will be able to:	<b>Developing</b> – a student whose understanding is developing will also be able to:	<b>Secure</b> – a student whose understanding is secure will also be able to:	<b>Advanced</b> – a student whose understanding is advanced will be able to do some of the following:	<b>Mastered</b> – a student who has mastered their understanding will be able to do all of the following consistently:
<b>Programming and Development</b>	Has practical experience of a high-level textual language, including using standard libraries when programming. Can use selection statements with support. Knows that small errors in text based programmes stop the programme from working.		Is able to use nested selection statements in a text based programming language. Can use while loops and for loops with support. Can debug the programme they have written with support.	Is aware of parameter passing in a text based programming language. Understands the difference between, and uses while loops and for loops in python. Is able to debug the programme they have written and suggest possible corrections.	Understands the difference between while loops and for loops, which uses a loop counter. Is confident in debugging a program they have written and is aware of the difference between syntax errors and logical errors.	
<b>Data and Data Representation</b>	Knows that digital computers use binary to represent all data. Understands how bit patterns represent numbers and images. Knows that computers transfer data in binary.		Understands how numbers, images, sounds and character sets use the same bit patterns. Performs simple operations using bit patterns eg binary addition. Understands the relationship between resolution and colour depth, including the effect on file size.	Can convert decimal numbers into binary ones and vice versa. Is aware of the relationship between binary and electrical circuits.	Performs operations using bit patterns eg conversion between binary and hexadecimal. Understands and can explain the need for data compression, and performs simple compression methods.	

<p><b>Hardware and Processing</b></p>	<p>Recognises and understands the function of the main internal parts of basic computer architecture. Understands the concepts behind the fetch-execute cycle. Knows that there is a range of operating systems and application software for the same hardware.</p>	<p>Is aware of the von Neumann architecture in relation to the CPU, including how data is stored in memory.</p>	<p>Is aware of the benefits of increased primary memory to improve the performance of a computer. Is aware that processors have instruction sets.</p>	<p>Has practical experience of a small (hypothetical) low level programming language. Understands and can explain Moore's Law. Understands and can explain multitasking by computers.</p>
<p><b>Communications and Networks</b></p>	<p>Understands how search engines rank search results. Understands how to construct static web pages using HTML and CSS. Understands data transmission between digital computers over networks, including the internet ie IP addresses and packet switching.</p>	<p>Knows the names of hardware eg hubs, routers, switches, and the names of protocols associated with networking computer systems. Uses technologies and online services securely, and knows how to identify and report inappropriate conduct.</p>	<p>Knows the purpose of the hardware and protocols associated with networking computer systems. Is aware of the client-server model including how dynamic web pages use server-side scripting and that web servers process and store data entered by users. Recognises that persistence of data on the internet requires careful protection of online identity and privacy.</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><b>IT</b></p>	<p>Evaluates the appropriateness of digital devices, internet services and application software to achieve given goals.          Recognises ethical issues surrounding the application of information technology beyond school.          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>Justifies the choice of and independently combines and uses multiple digital devices, internet services and application software to achieve given goals.          Evaluates the trustworthiness of digital content and considers the usability of visual design features when designing and creating digital artefacts for a known audience.          Identifies and explains how the use of technology can impact on society.          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>Undertakes creative projects that collect, analyse, and evaluate data to meet the needs of a known user group. Effectively designs and creates digital artefacts for a wider or remote audience.          Considers the properties of media when importing them into digital artefacts.          Documents user feedback, the improvements identified and the refinements made to the solution.          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>Meets secure criteria and understands the ethical issues surrounding the application of information technology, and the existence of legal frameworks governing its use eg Data Protection Act, Computer Misuse Act, Copyright etc.</p>
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