| Year 8 | Emerging | Developing | Secure | Excelling |
|---|---|---|---|---|
| Algorithms | • **Knows** what an algorithm is<br>• **Knows** that computers need precise instructions<br>• **Knows** the importance of **avoiding basic errors** when writing an algorithm | • **Is able to** express basic algorithms using symbols<br>• **Is able to** record basic algorithms with precision<br>• **Is able to** avoid basic errors | • **Understands** that algorithms are implemented on digital devices as programmes<br>• **Understands** how to design simple algorithms using loops and selection i.e. 'If' statements<br>• **Understands** how to use logical reasoning to predict outcomes<br>• **Understands** how to find and correct errors i.e. debugging in algorithms | • shows a **developed understanding** of what an algorithm is and their importance in computing<br>• shows a **developed understanding** of how to design more complex algorithms that use repetition and two-way selection i.e. if, then, else<br>• Shows a **developed understanding** of how to use logical reasoning to predict outputs, showing an awareness of inputs<br>• Shows a **developed understanding** of how to find errors and correct these using diagrams to express solutions |
| Programming and development | • **Knows** that users can write their own programmes<br>• **Knows** how to **run, check and change** programmes<br>• **Knows** that programmes run by following precise instructions | • **Is able to** create a simple programme<br>• **Is able to** identify errors in a programme<br>• **Is able to** write precise instructions | • **Understands** how to use arithmetic operators, if statements and loops, within programmes<br>• **Understands** how to use logical reasoning to predict the behaviour of programmes<br>• **Understands** how to find and correct simple semantic errors i.e. debugging in programmes | • Shows a **developed understanding** of how to create programmes that implement algorithms to achieve given goals<br>• Shows a **developed understanding** of how to declare and assign variables<br>• Shows a **developed understanding** of how to use post-tested loops e.g. 'until', and a sequence of selection statements in programmes, including use of if…then… else statement |

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| Data and data representation | • **Knows** the different types of data: text, number<br>• **Knows** that programmes can work with different types of data<br>• **Knows** that data can be structured in tables to make it useful<br>• **Knows** that Binary is a number system that only uses two digits: 1 and 0 | • **Is able to** use filters or can perform single criteria searches for information<br>• **Is able to** structure data in tables to make it useful<br>**Is able to** convert between binary and denary | • **Understands** how to perform complex searches for information e.g. using Boolean and relational operators<br>• **Understands** how digital computers use binary to represent all data<br>• **Understands** how to perform addition of binary numbers | • Shows **a developed understanding** of how bit patterns represent numbers and images<br>• Shows **a developed understanding** of how computers transfer data in binary<br>• Shows **a developed understanding** of the relationship between binary and file size (uncompressed)<br>• Shows **a developed understanding** of performing operations using bit patterns e.g. conversion between binary and hexadecimal, binary subtraction etc |
| Hardware & Processing | • **Knows** that a range of digital devices can be considered a computer<br>• **Knows** and can use a range of input and output devices<br>• **Knows** that computers have no intelligence and that computers can do nothing unless a programme is run<br>• **Knows** that all software executed on digital devices is programmed | • **Is able to** differentiate between hardware and application software, and their roles within a computer system.<br>• **Is able to** explain how computers collect data from various input devices, including sensors and application software.<br>• **Is able to** describe the differences between physical, wireless and mobile networks. | • **Understands** the function of the main internal parts of basic computer architecture.<br>• **Understands** the concepts behind the fetch-execute cycle.<br>• **Understands** that there is a range of operating systems and application software for the same hardware. | • Shows **a developed understanding** of the von Neumann architecture in relation to the fetch-execute cycle, including how data is stored in memory<br>• Shows **a developed understanding** of the basic function and operation of location addressable memory |

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|---|---|---|---|---|
| Communications and networks | • **Knows** how to find content from the world wide web using a web browser<br>• **Knows** the importance of communicating safely and respectfully online, and the need for keeping personal information private<br>• **Knows** what to do when concerned about content or being contacted | • **Is able to** navigate the web and can carry out simple web searches to collect digital content<br>• **Is able to** demonstrate safe practices when using computers safely and responsibly<br>• **Is able to** report unacceptable content and contact when online<br>• **Is able to** construct a static web page using HTML. | • **Understands** the difference between the internet and internet service e.g. world wide web<br>• **Understands** the role of, and can use a range of internet services e.g. VOIP<br>• **Understands** what is acceptable and unacceptable behaviour when using technologies and online services<br>• **Understands** know how to construct interconnected multimedia web pages using HTML. | • Shows **a developed understanding** of how search results are selected, including that search engines use 'web crawler s'<br>• Shows **a developed understanding** of how search engines rank search results and the impact this has on business practices<br>• Shows **a developed understanding** of how to construct connected multimedia web pages using HTML |
| Information Technology and Digital Literacy | • **Knows** how to use software under the control of the teacher to create, store and edit digital content using appropriate file and folder names<br>• **Knows** that people interact with computers<br>• **Knows** common uses of information technology beyond the classroom | • **Is able to** talk about own work and make changes to improve it<br>• **Is able to** independently use technology to purposefully organise digital content.<br>• **Is able to** show an awareness for the quality of digital content collected<br>• **Is able to** use a variety of software to manipulate and present digital content: and information<br>• **Is able to** share own experiences of technology in school and beyond the classroom<br>• **Is able to** talk about own work and make improvements to solutions based on feedback received | • **Understands** how to collect, organise and present data and information in digital content.<br>• **Understands** how to create digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience e.g. blogging<br>• **Understands the need to** make appropriate improvements to solutions based on feedback received, and can comment on the success the solution. | • Shows **a developed understanding** of the need to make judgements about digital content when evaluating and repurposing it for a given audience<br>• Shows **a developed understanding** of the importance of addressing the needs of an audience when designing and creating digital content<br>• Shows **a developed understanding** of the need to determine success criterion when evaluating the quality of solutions |