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|  | **Computer Science**  **KEY STAGE THREE ASSESSMENT FRAMEWORK, YEAR 7** | | | | |
| **Learning Focus** | **Milestone 1** | **Milestone 2** | **Milestone 3** | **Milestone 4** | **Milestone 5** |
| **Emerging** | **Developing** | **Securing** | **Mastering** | **Beyond** |
| **Programming, Development and Algorithms**  *Unit 1*  *Unit 4*  *Unit 5*  *Unit 6* | **I/I can:**  understand that computers need precise instructions  know that users can develop their own programs, and can demonstrate this by creating a simple program (with support) | **I/I can:**  design simple algorithms using loops, and selection i.e. if statements  use arithmetic operators (+,-,\*,/), if statements, and  loops, within programs  create programms that give a meaningful output  use logical reasoning to predict the behaviour of programs  detect and corrects simple errors i.e. debugging, in programs | **I/I can:**  design solutions (algorithms) that use repetition and two-way selection i.e. if, then and else  use flowcharts to express solutions.  use logical reasoning to predict outputs, having an awareness of inputs.  Create programms that take an input, process data and give a meaningful output.  declare and assigns variables  use post-tested loop e.g. ‘until’, and a sequence of selection statements in programs, including an “if, then and else” statement | **I/I can:**  design solutions by decomposing a problem and creates a sub-solution for each of these parts  recognise that different solutions exist for the same problem  selects the appropriate data types  create programs that implement algorithms to achieve given goals | **I/I can:**  Understand that iteration is the repetition of a process such as a loop  identify similarities and differences in situations and can use these to solve problems (pattern recognition)  be able to create a basic search and bubble sort algorithm  practical experience of a high-level textual language, including using standard libraries when programming  use a range of operators and expressions e.g. Boolean, and applies them in the context of program control. |
| **Hardware & Processing**  *Unit 2* | **I/I can:**  understand that computers have no intelligence and that computers can do nothing unless a program is executed  recognise that all software executed on digital devices is programmed | **I/I can:**  recognise that a range of digital devices can be considered a computer  recognise and can use a range of input and output devices understand how programs specify the function of a general purpose computer | **I/I can:**  know that computers collect data from various input devices, including sensors and application software  understand the difference between hardware and application software, and their roles within a computer system | **I/I can:**  understand why and when computers are used  understand the main functions of the operating system  know the difference between physical, wireless and mobile networks | **I/I can:**  recognise and understands the function of the main internal parts of basic computer architecture  understands the concepts behind the fetch-execute cycle |
| **Information Technology**  *Unit 3* | **I/I can:**  use software under the control of the teacher to create, store and edit digital content using appropriate file and folder names  understand that people interact with computers  talk about my work and makes changes to improve it | **I/I can:**  use technology with increasing independence to  purposefully organise digital content  show an awareness for the quality of digital content collected  use a variety of software to manipulate and present  digital content: data and information  talk about my work and make improvements to solutions based on feedback received | **I/I can:**  collect, organise and present data and information in digital content  create digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience e.g. blogging  make appropriate improvements to solutions based on feedback received, and can comment on the success of the solution | **I/I can:**  make judgements about digital content when evaluating and repurposing it for a given audience  recognise the audience when designing and creating digital content  understand the potential of information technology for collaboration when computers are networked  use criteria to evaluate the quality of solutions, can identify improvements making some refinements to the solution, and future solutions | I**/I can:**  evaluate the appropriateness of digital devices, internet services and application software to achieve given goals  design criteria to critically evaluate the quality of solutions, uses the criteria to identify improvements and can make appropriate refinements to the solution |

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|  | **Computer Science**  **KEY STAGE THREE ASSESSMENT FRAMEWORK, YEAR 8** | | | | |
| **Learning Focus** | **Milestone 1** | **Milestone 2** | **Milestone 3** | **Milestone 4** | **Milestone 5** |
| **Emerging** | **Developing** | **Securing** | **Mastering** | **Beyond** |
| **Programming, Development and Algorithms**  ***Unit 3***  ***Unit 5*** | **I / I can:**  design simple algorithms using loops, and selection i.e. if statements  use arithmetic operators (+,-,\*,/), if statements, and  loops, within programs  create programs that give a meaningful output  use logical reasoning to predict the behaviour of programs  detect and corrects simple errors i.e. debugging, in programs | **I can:**  design solutions (algorithms) that use repetition and two-way selection i.e. if, then and else  use flowcharts to express solutions.  use logical reasoning to predict outputs, having an awareness of inputs.  Create programs that take an input, process data and give a meaningful output.  declare and assigns variables  use post-tested loop e.g. ‘until’, and a sequence of selection statements in programs, including an “if, then and else” statement | **I can:**  design solutions by decomposing a problem and creates a sub-solution for each of these parts  recognise that different solutions exist for the same problem  selects the appropriate data types  create programs that implement algorithms to achieve given goals | **I can:**  Understand that iteration is the repetition of a process such as a loop  identify similarities and differences in situations and can use these to solve problems (pattern recognition)  be able to create a basic search and bubble sort algorithm  practical experience of a high-level textual language, including using standard libraries when programming  use a range of operators and expressions e.g. Boolean, and applies them in the context of program control. | **I can:**  understand a recursive solution to a problem repeatedly applies the same solution to smaller instances of the problem  recognise that some problems share the same characteristics and use the same algorithm to solve both  understand the notion of performance for algorithms and appreciates that some algorithms have different performance characteristics for the same task  use nested selection statements  appreciate the need for, and writes, custom functions including use of parameters  tell the difference between, and uses appropriately, procedures and functions  understand and uses negation with operators |
| **Data & Data Representation**  **Unit 2** | I/I can:  recognise different types of data: text, number  appreciate that programs can work with different types of data  recognise that data can be structured in tables to make it useful | I/I can:  know that digital computers use binary to represent all data  understand the difference between data and information  know why sorting data in a flat file can improve searching for information | I can:  understand how bit patterns represent numbers and images  perform more complex searches for information e.g. using Boolean and relational operators  analyses and evaluates data and information, and recognises that poor quality data leads to unreliable results, and inaccurate conclusions  list a wide range of security measures | I/I can:  know that computers transfer data in binary  perform simple operations using bit patterns e.g.  binary addition  understand the relationship between binary and file size (uncompressed)  query data on one table using a typical query language | I can:  understand how numbers, images, sounds and character sets use the same bit patterns  understand the relationship between resolution and colour depth, including the effect on file size  distinguish between data used in a simple program (a variable) and the storage structure for that data  knows a wide range of system security vulnerabilities and how to avoid them |
| **Communication & Networks**  **Unit 1**  **Unit 4** | I/I can:  navigates the web and can carry out simple web searches to collect digital content  demonstrate use of computers safely and responsibly, knowing a range of ways to report unacceptable content and contact when online | I/I can:  understand the difference between the internet and internet service e.g. world wide web  shows an awareness of, and can use a range of internet services e.g. VOIP  recognise what is acceptable and unacceptable behaviour when using technologies and online services | I/I can:  understand how to effectively use search engines, and knows how search results are selected, including that search engines use ‘web crawler programs’  select, combine and uses internet services  demonstrate responsible use of technologies and online services, and knows a range of ways to report concerns  can identify the function of the main components of a network  understand the difference between a LAN and WAN | I/I can:  understand how search engines rank search results  understand how to construct static web pages using HTML and CSS  understand data transmission between digital computers over networks; Including the cloud and the concept of virtual networks including the internet i.e. IP addresses and packet switching  can explain the function of the main components of a network  recognise star and mesh network topologies | I can:  know the names of hardware e.g. hubs, routers, switches, and the names of protocols; SMTP, iMAP, POP, FTP, HTTP/S, TCP/ IP, associated with networking computer systems  use technologies and online services securely, and knows how to identify and report inappropriate conduct  understands packet switching |

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| **Computer Science**  **KEY STAGE THREE ASSESSMENT FRAMEWORK, YEAR 9** | | | | | |
| **Learning Focus** | **Milestone 1** | **Milestone 2** | **Milestone 3** | **Milestone 4** | **Milestone 5** |
| **Emerging** | **Developing** | **Securing** | **Mastering** | **Beyond** |
| **Programming, Development and Algorithms**  Unit 3 | **I / I can:**  design solutions (algorithms) that use repetition and two-way selection i.e. if, then and else  use flowcharts to express solutions.  use logical reasoning to predict outputs, having an awareness of inputs.  Create programs that take an input, process data and give a meaningful output.  declare and assigns variables  use post-tested loop e.g. ‘until’, and a sequence of selection statements in programs, including an “if, then and else” statement | **I/I can:**    design solutions (algorithms) that use repetition and two-way selection i.e. if, then and else  use flowcharts to express solutions.  use logical reasoning to predict outputs, having an awareness of inputs.  Create programms that take an input, process data and give a meaningful output.  declare and assigns variables  use post-tested loop e.g. ‘until’, and a sequence of selection statements in programs, including an “if, then and else” statement | **I/I can:**  design solutions by decomposing a problem and creates a sub-solution for each of these parts  recognise that different solutions exist for the same problem  selects the appropriate data types  create programs that implement algorithms to achieve given goals | **I/I can:**  Understand that iteration is the repetition of a process such as a loop  identify similarities and differences in situations and can use these to solve problems (pattern recognition)  be able to create a basic search and bubble sort algorithm  practical experience of a high-level textual language, including using standard libraries when programming  use a range of operators and expressions e.g. Boolean, and applies them in the context of program control. | **I/I can:**  evaluate the effectiveness of algorithms and models for similar problems  recognise where information can be filtered out in generalising problem solutions  use logical reasoning to explain how an algorithm works  represent algorithms using structured language  understand and apply parameter passing  understand the difference between, and uses, both pre-tested e.g. ‘while’, and post-tested e.g. ‘until’ loops  applies a modular approach to error detection and correction |
| **Hardware & Processing**  Unit 1 | **I/I can:**  recognise that a range of digital devices can be considered a computer  recognise and can use a range of input and output devices understand how programs specify the function of a general purpose computer | **I/I can:**  know that computers collect data from various input devices, including sensors and application software  understand the difference between hardware and application software, and their roles within a computer system | **I/I can:**  understand why and when computers are used  understand the main functions of the operating system  know the difference between physical, wireless and mobile networks | **I/I can:**  recognise and understands the function of the main internal parts of basic computer architecture  understand CPU components and their functions and how they relate to memory  understands the concepts behind the fetch-execute cycle | **I/I can:**  knows that processors have instruction sets and that these relate to low-level instructions carried out by a computer |
| **Communication & Networks**  Unit 2  Unit 4 | **I/I can:**  navigates the web and can carry out simple web searches to collect digital content  demonstrate use of computers safely and responsibly, knowing a range of ways to report unacceptable content and contact when online | **I/I can:**  understand the difference between the internet and internet service e.g. world wide web  shows an awareness of, and can use a range of internet services e.g. VOIP | **I/I can:**  understand how to effectively use search engines, and knows how search results are selected, including that search engines use ‘web crawler programs’  select, combine and uses internet services | **I/I can:**  understand how search engines rank search results  understand how to construct static web pages using HTML and CSS  understand data transmission between digital computers over networks; Including the cloud and the concept of virtual networks including the internet i.e. IP addresses and packet switching  understand the difference between a LAN and WAN and can explain the function of the main components  recognise star and mesh network topologies | **I/I can:**  knows the purpose of the hardware and protocols associated with networking computer systems  understand 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 |
| **Information Technology**  Unit 5 | **I/I can:**  use technology with increasing independence to  purposefully organise digital content  show an awareness for the quality of digital content collected  use a variety of software to manipulate and present  digital content: data and information  share their experiences of technology in school and beyond the classroom  talk about their work and makes improvements to solutions based on feedback received | **I/I can:**  collect, organise and present data and information in digital content  creates digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience e.g. blogging  make appropriate improvements to solutions based on feedback received, and can comment on the success of the solution | **I/I can:**  make judgements about digital content when evaluating and repurposing it for a given audience  recognise the audience when designing and creating digital content  understand the potential of information technology for collaboration when computers are networked  use criteria to evaluate the quality of solutions, can identify improvements making some refinements to the solution, and future solutions | I**/I can:**  evaluate the appropriateness of digital devices, internet services and application software to achieve given goals  recognise ethical issues surrounding the application of information technology beyond school  design criteria to critically evaluate the quality of solutions, uses the criteria to identify improvements and can make appropriate refinements to the solution | **I/I can:**  undertake 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  document user feedback, the improvements identified  and the refinements made to the solution  explain and justify how the use of technology impacts on society, from the perspective of social, economic, political, legal, ethical and moral issues |