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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 outputuse logical reasoning to predict the behaviour of programsdetect 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 elseuse 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 variablesuse 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 partsrecognise that different solutions exist for the same problem selects the appropriate data typescreate programs that implement algorithms to achieve given goals | **I/I can:** Understand that iteration is the repetition of a process such as a loopidentify similarities and differences in situations and can use these to solve problems (pattern recognition)be able to create a basic search and bubble sort algorithmpractical experience of a high-level textual language, including using standard libraries when programminguse 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 executedrecognise that all software executed on digital devices is programmed | **I/I can:** recognise that a range of digital devices can be considered a computerrecognise and can use a range of input and output devicesunderstand 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 softwareunderstand the difference between hardware and application software, and their roles within a computer system | **I/I can:** understand why and when computers are usedunderstand the main functions of the operating systemknow the difference between physical, wireless and mobile networks | **I/I can:**recognise and understands the function of the main internal parts of basic computer architectureunderstands 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 namesunderstand that people interact with computerstalk about my work and makes changes to improve it | **I/I can:** use technology with increasing independence to purposefully organise digital contentshow an awareness for the quality of digital content collecteduse a variety of software to manipulate and present digital content: data and informationtalk about my work and make improvements to solutions based on feedback received | **I/I can:** collect, organise and present data and information in digital contentcreate digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience e.g. bloggingmake 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 audiencerecognise the audience when designing and creating digital contentunderstand the potential of information technology for collaboration when computers are networkeduse 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 goalsdesign 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 outputuse logical reasoning to predict the behaviour of programsdetect 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 elseuse 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 variablesuse 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 partsrecognise that different solutions exist for the same problem selects the appropriate data typescreate programs that implement algorithms to achieve given goals | **I can:** Understand that iteration is the repetition of a process such as a loopidentify similarities and differences in situations and can use these to solve problems (pattern recognition)be able to create a basic search and bubble sort algorithmpractical experience of a high-level textual language, including using standard libraries when programminguse 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 bothunderstand the notion of performance for algorithms and appreciates that some algorithms have different performance characteristics for the same taskuse nested selection statements appreciate the need for, and writes, custom functions including use of parameterstell 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, numberappreciate that programs can work with different types of datarecognise 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 imagesperform more complex searches for information e.g. using Boolean and relational operatorsanalyses and evaluates data and information, and recognises that poor quality data leads to unreliable results, and inaccurate conclusionslist a wide range of security measures | I/I can: know that computers transfer data in binaryperform 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 patternsunderstand the relationship between resolution and colour depth, including the effect on file sizedistinguish between data used in a simple program (a variable) and the storage structure for that dataknows 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 contentdemonstrate 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 webshows an awareness of, and can use a range of internet services e.g. VOIPrecognise 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 servicesdemonstrate responsible use of technologies and online services, and knows a range of ways to report concernscan identify the function of the main components of a networkunderstand the difference between a LAN and WAN | I/I can: understand how search engines rank search resultsunderstand how to construct static web pages using HTML and CSSunderstand 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 switchingcan explain the function of the main components of a networkrecognise 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 systemsuse technologies and online services securely, and knows how to identify and report inappropriate conductunderstands 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 elseuse 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 variablesuse 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 elseuse 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 variablesuse 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 partsrecognise that different solutions exist for the same problem selects the appropriate data typescreate programs that implement algorithms to achieve given goals | **I/I can:** Understand that iteration is the repetition of a process such as a loopidentify similarities and differences in situations and can use these to solve problems (pattern recognition)be able to create a basic search and bubble sort algorithmpractical experience of a high-level textual language, including using standard libraries when programminguse 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 problemsrecognise where information can be filtered out in generalising problem solutionsuse logical reasoning to explain how an algorithm worksrepresent algorithms using structured language understand and apply parameter passingunderstand 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 computerrecognise and can use a range of input and output devicesunderstand 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 softwareunderstand the difference between hardware and application software, and their roles within a computer system | **I/I can:** understand why and when computers are usedunderstand the main functions of the operating systemknow the difference between physical, wireless and mobile networks | **I/I can:**recognise and understands the function of the main internal parts of basic computer architectureunderstand CPU components and their functions and how they relate to memoryunderstands 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 2Unit 4 | **I/I can:** navigates the web and can carry out simple web searches to collect digital contentdemonstrate 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 webshows 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 resultsunderstand how to construct static web pages using HTML and CSSunderstand 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 switchingunderstand the difference between a LAN and WAN and can explain the function of the main componentsrecognise star and mesh network topologies | **I/I can:**knows the purpose of the hardware and protocols associated with networking computer systemsunderstand the client-server model including how dynamic web pages use server-side scripting and that web servers process and store data entered by usersrecognises 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 contentshow an awareness for the quality of digital content collecteduse a variety of software to manipulate and present digital content: data and informationshare their experiences of technology in school and beyond the classroomtalk about their work and makes improvements to solutions based on feedback received | **I/I can:** collect, organise and present data and information in digital contentcreates digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience e.g. bloggingmake 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 audiencerecognise the audience when designing and creating digital contentunderstand the potential of information technology for collaboration when computers are networkeduse 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 goalsrecognise ethical issues surrounding the application of information technology beyond schooldesign 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 groupeffectively designs and creates digital artefacts for a wider or remote audiencedocument user feedback, the improvements identified and the refinements made to the solutionexplain and justify how the use of technology impacts on society, from the perspective of social, economic, political, legal, ethical and moral issues |