|  |  |  |  |
| --- | --- | --- | --- |
| Progression through the three strands | | | |
| Computing Strand | Year 1 | Year 2 | Expectation at the end of key stage |
| Computer Science | * Understand what an algorithm is and create simple linear algorithms. * Understand that computers need precise instructions. * Understand how to develop programs, avoid errors and make checks and changes. * Create a simple program using Blubots (an environment that does not rely on text). * Understand that computers have no intelligence and they can do nothing unless a program is executed. * Recognise that all software executed on digital devices is programmed. | * Understand that algorithms are implemented on digital devices as programs. * Design simple algorithms using loops, and selection i.e. if statements. * Uses logical reasoning to predict outcomes. * Detect and correct errors i.e. debugging, in algorithms. * Recognise that a range of digital devices can be considered a computer. * Understand how programs specify the function of a general purpose computer. | * Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. * Create and debug simple programs. * Use logical reasoning to predict the behaviour of simple programs. |
| Information Technology | * Recognise that digital content can be represented in many forms. * Explain the different ways that digital content can communicate information. * Obtain content from the world wide web using a web browser. * Use software under the control of the teacher to create, store and edit digital content using appropriate file and folder names. * Talks about their work and makes changes to improve it. | * 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. * Recognise that a range of digital devices can be considered a computer. * Recognise and use a range of input and output devices. * Navigate the web and carry out simple web searches to collect digital content. * Use technology with increasing independence to purposefully organise digital content. * Uses a variety of software to manipulate and present digital content: data and information. * Share experiences of technology in school and beyond the classroom. * Talk about their work and make improvements to solutions based on feedback received. | * Use technology purposefully to create, organise, store, manipulate and retrieve digital content. * Recognise common uses of information technology beyond school. |
| Digital Literacy | * Understand the importance of communicating safely and respectfully online, and the need for keeping personal information private. * Know what to do when concerned about content or being contacted. * Know common uses of information technology beyond the classroom. * Share their use of technology in school. | * Demonstrate use of computers safely and responsibly, knowing a range of ways to report unacceptable content and contact when online. * Show an awareness for the quality of digital content collected. | * Use technology safely and respectfully, keeping personal information private. * Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Computing Strand | Year 3 | Year 4 | Year 5 | Year 6 | Expectation at the end of key stage |
| Computer Science | * Design algorithms that use repetition and two-way selection i.e. if, then and else. * Use diagrams to show algorithms. * Use logical reasoning to predict outputs, showing an awareness of inputs. * Create programs that implement algorithms to achieve given goals. * Use variables. * Use post-tested loop e.g. ‘until’, and a sequence of selection statements in programs, including an if, then and else statement. * 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. * Understand the difference between the internet and internet service e.g. world wide web. | * Show an awareness of tasks best completed by humans or computers. * Design solutions by decomposing a problem and creating a sub-solution for each of the parts. * Recognise that different solutions exist for the same problem. * Understand the difference between, and appropriately use if and if, then and else statements. * Use variables within a loop. * Design, write and debug codes. * Know the different ways to create a code and how to make it the most efficient * Understands why and when computers are used. * Understands the main functions of the   operating system.   * Understands how to effectively use search engines, and knows how search results are selected,   including that search engines use ‘web crawler programs’. | * Understands that iteration is the repetition of a process such as a loop. * Recognises   that different algorithms exist for the same problem.   * Represents solutions using a   structured notation.   * Can identify similarities and differences in situations and can use these to solve problems (pattern recognition). * Understands that programming bridges the gap between algorithmic solutions and computers. * Has practical experience of a high-level textual language, including using standard libraries   when programming.   * Uses a range of operators and expressions and   applies them in the context of program control.   * Selects the appropriate data types. | * Defines data types. * 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 the relationship between binary   and file size (uncompressed).   * Recognises and understands the function of the main internal parts of basic computer   architecture.  Understands the concepts behind the fetch-execute cycle.   * 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 i.e. IP addresses and packet switching.**.** | * Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. * Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. * Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. |
| Information Technology | * Understands the difference between data and information. * Knows why sorting data in a flat file can improve searching for information. * Uses filters or can perform single criteria searches for information. * Shows an awareness of, and can use a range of internet services e.g. VOIP. * Collects, organises and presents 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.  Makes appropriate improvements to solutions based on feedback received, and can comment on the success of the  solution. | * Performs 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.   * Knows the difference between physical, wireless and mobile networks. * Recognises the audience when designing and creating digital content. * Uses criteria to evaluate the quality of solutions, can identify   improvements making some refinements to the solution, and future  solutions. | * Queries data on one table using a typical query language. * Knows that there is a range of operating systems and application software for the same hardware. | * Evaluates the appropriateness of digital devices, internet services and   application software to achieve given goals.   * Designs criteria to critically evaluate the quality of solutions, uses the criteria to identify improvements and can make appropriate refinements to the solution. | * Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration. * Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. |
| Digital Literacy | * Recognises what is acceptable and * unacceptable behaviour when using * technologies and online services. | * Makes judgements about digital content when evaluating and repurposing it for a given audience. * Demonstrates responsible use of   technologies and online services, and knows  a range of ways to report concerns.   * Selects, combines and uses internet services. * Understands the potential of information   technology for collaboration when computers  are networked. | * Recognises ethical issues surrounding the   application of information technology beyond  school. | * Uses technologies and online services securely, and knows how to identify and report inappropriate conduct. * Identifies and explains how the use of technology can impact on society. | * Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. * Use technology safely, respectfully and responsibly. |