

**Computing Threshold Concepts**

Overarching Computing theme: xx

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|  |  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **COMPUTER SCIENCE** | **Knowledge** | 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. | 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. | Design, write and debug programs that accomplish specific goals, including controlling or stimulating 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.  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. | Design, write and debug programs that accomplish specific goals, including controlling or stimulating 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.  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. | Design, write and debug programs that accomplish specific goals, including controlling or stimulating 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.  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. | Design, write and debug programs that accomplish specific goals, including controlling or stimulating 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.  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. |
| **Skills** | Explain that an algorithm is a set of instructions used to solve a problem or achieve an objective.  Work out what is wrong with a simple algorithm when the steps are out of order (e.g. PM - The Wrong Sandwich)  Write a simple algorithm (set of instructions)  Make logical attempts to fix a code (e.g. PM - Bubbles activity)  Read a code to predict what might happen (e.g. PM – 2Go Turtle) | Understand that instructions need to be precise so they can be successfully converted into code.  Create a simple program.  Identify and correct some errors (e.g. PM – Debug Challenges: Chimp)  Identify parts of a program that respond to specific events and initiate specific actions (e.g. write a cause and effect sentence of what will happen in a program) | Write an algorithm for a real-life situation, identifying any errors and taking steps to fix it.  Design and code a program that follows a simple sequence.  Use repetition effects in their programs; exploring the difference using a repeat command and a timer command.  Use logical, achievable steps when designing a program.  Identify and correct errors in algorithms (e.g. 2Code traffic light)  Read programs with several steps and predict the outcome accurately.  Identify ways the internet is used to communicate.  Open, respond to and attach files to emails (e.g. 2Email) | Use coding structures for selection and repetition.  Attempt to debug their own programs.  Use timers to achieve repetition.  Use ‘if statements’ for selection.  Use and manipulate the value of variables.  Use user inputs and outputs (e.g. 2Code)  Use ‘if statements’, repetition and variables in their program design.  Use step-through methods to identify errors in code and make logical attempts to correct it (e.g. 2Code traffic light)  Read programs with several steps and predict the outcome accurately.  Name the component parts of hardware which allow computers to join and form a network. | Write an algorithm, of a real-life situation, for a program by deconstructing into manageable parts.  Test and debug their programs as they go, using logical methods to identify the cause of any bug (may need support to identify the specific code)  Translate algorithms, which include sequence, selection and repetition, into code.  Combine sequence, selection and repetition with other coding structures in their algorithm design.  Use tabs to organise code.  Name variables.  Discuss the value and the main dangers of computer networks.  Explain what is meant by ‘personal information’ and how to keep it safe.  Select the most appropriate form of online communications, depending on audience and digital content. | Turn a more complex programming task into an algorithm by identifying the important aspects of the task.  Test and debug their programs as they go; identifying the cause of the bug and demonstrating a systematic approach to identify a particular line of code.  Translate algorithms that include sequence, selection and repetition into code  Interpret a program in parts and make logical attempts to put the separate parts of a complex algorithm together to explain the program as a whole.  Explain, in some depth, the difference between the internet and the World Wide Web.  Explain what WAN and LAN are and describe how they access internet in school. |
| **INFORMATION TECHNOLOGY** | **Knowledge** | Use technology purposefully to create, organise, store, manipulate and retrieve digital content. | Use technology purposefully to create, organise, store, manipulate and retrieve digital content. | Use search engines effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.  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 and presenting data and information. | Use search engines effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.  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 and presenting data and information. | Use search engines effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.  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 and presenting data and information. | Use search engines effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.  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 and presenting data and information. |
| **Skills** | Name, save and retrieve their work.  Follow simple instructions to access online resources.    Sort and collate information (e.g. PM – 2Quiz sorting shapes, 2Count pictograms) | Organise data using a database (e.g.PM 2Investigate)  Edit more complex digital data (e.g. PM – 2Sequence music compositions)  Use a range of media in their digital content including photos, text and sound. | Use a search engine to retrieve relevant digital content.  Collect, analyse, evaluate and present data and information using a selection of software (e.g. 2Question branching database, 2Graph), choosing which software is most appropriate.  Create content to attach to an email. | Use and understand the function, features and layout of a search engine.  Assess given webpages for credibility and information at a basic level.  Choose and use most appropriate software when presenting information and data.  Create linked content using a range of software (e.g. 2Connect, 2Publish)  Share digital content within their community. | Explain how credible a webpage, and the information it contains, is.  Create content and solutions using digital features within software.  Use several ways of sharing digital content. | Apply filters when searching for digital content.  Compare a range of digital content sources and are able to them in terms of content quality and accuracy.  Use critical thinking skills in everyday use of online communication.  Design and create digital content with a clear audience in mind.  Design and create their own blogs (e.g. 2Blog) |
| **DIGITAL LITERACY** | **Knowledge** | Recognise common uses of information technology behind school.  Use technology safely and respectively, 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. | Recognise common uses of information technology behind school.  Use technology safely and respectively, 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. | Use technology safely, respectively and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concern about content or contact. | Use technology safely, respectively and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concern about content or contact. | Use technology safely, respectively and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concern about content or contact. | Use technology safely, respectively and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concern about content or contact. |
| **Skills** | Explain what ‘technology’ means and name uses of technology, in and out of school.  Explain the importance of keeping information (usernames and passwords) private. | Use a search engine to find relevant content.  Make links between technology they see around them and work they do in school.  Discuss the consequences of inappropriate online searches and name ways of reporting inappropriate behaviours.  Use email safely. | Create a secure password and explain implications of not keeping it safe.  Use the internet safely and describe ways of keeping themselves safe online.  Name at least two ways of reporting unacceptable content and contact. | Explain to others the importance of keeping safe online.  Name a range of ways to report unacceptable content and contact. | Demonstrate safe and respectful use of a few different technologies and online services.  Relate appropriate online behaviour to their right to personal privacy and mental wellbeing of themselves and others. | Demonstrate safe and respectful use of a range of different technologies and online services.  Explain why it is important to keep their own information private, for their own and others online safety. |