

Computing Whole School Progression Map

Key Stage 2 National Curriculum – Pupils should be taught to:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by composing 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
- 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; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Key Stage 3 National Curriculum – Pupils should be taught to:

- design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems
- understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem
- use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions
- understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal]
- understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems
- understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits
- undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users
- create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability
- understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns.

Year Group	Programming	Systems & Networks	Digital Media	Digital Literacy (incl. Online Safety)
5	Scratch - Variables in games KNOW THAT: - a variable is something that can be set and changed during the running of a program - Scratch games are programmed using algorithms, which are sets of rules for performing a task KNOW HOW TO: - design, write and debug a simple game in Scratch - use sequence, selection and repetition in their designs - identify and modify variables	Microsoft Office and Our School Network KNOW THAT: - documents saved in pupils' home drives can only be accessed by the account holder - documents saved in School Share can be accessed by anyone with a James Bateman Microsoft account KNOW HOW TO: - access email accounts - save files to appropriate locations	All About Me (Word) All About JBMS (PPT) KNOW THAT: - photos should never be resized from the sides in order to preserve the aspect ratio KNOW HOW TO: - use keyboard shortcuts - choose appropriate fonts - insert images into Word documents and PowerPoint presentations - Change backgrounds - Change fonts - Insert text boxes - Insert photos - Wrap text for objects	All About Me (Word) All About JBMS (PPT) KNOW THAT: - information can be displayed using a variety of software, such as Word and PowerPoint - photos and videos from iPads can be used with Microsoft video software - cloud storage (One Drive) can be used to access files from multiple devices KNOW HOW TO: - access email accounts - insert and download email attachments

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6	Kodu KNOW THAT: - Kodu games are programmed using algorithms, which are sets of rules for performing a task - environments must contain either glass walls or elevation around the edge to prevent objects from falling off during game play KNOW HOW TO: - design, write and debug a simple game in Kodu that at least one player must win - use sequence, selection and repetition in their designs - implement ideas for improving games and give others advice to improve	Microsoft Office and Our School Network KNOW THAT: - documents saved in pupils' home drives can only be accessed by the account holder - documents saved in School Share can be accessed by anyone with a James Bateman Microsoft account KNOW HOW TO: - access email accounts - save files to appropriate locations	Paint 3D Animation KNOW THAT: - objects in Paint 3D can be rotated 360° - creating more slides for stop motion animation with slight changes creates smoother movement KNOW HOW TO: - create a 3D character in Paint 3D - move and manipulate objects while rotating to ensure continuity for 360° views - use PowerPoint to create a stop motion animation - insert automatically played voice recordings into slides to create video narration	Creating media - web design KNOW THAT: - internal hyperlinks link to another portion of the web page - external hyperlinks link to another web page altogether - web pages can be accessed on a range of devices - all information and photos should be credited to the author KNOW HOW TO: - create a web page from scratch using Google Sites - create both internal and external hyperlinks for photos and text - cite sources using hyperlinks - use previews and edit layouts as needed to ensure web pages can be read easily and accessed from different devices

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7	micro:bits KNOW THAT: - a variable is something that can be set and changed during the running of a program - micro:bits are programmed using algorithms, which are sets of rules for performing a task - the correct order of programming blocks is essential KNOW HOW TO: - identify inputs and outputs and explain how they work - design, write and debug code for micro:bits - modify code to improve or change functions - identify and modify variables	Networks: from semaphores to the internet KNOW THAT: - a protocol is a set of rules for formatting and processing data - HTTP(S) is the protocol used when connecting to websites - bandwidth is the amount of data that can be moved from one point to another in a given time - data sent over networks is broken down into smaller segments called packets KNOW HOW TO: - identify what hardware is used to connect to a network and explain how they work - explain the benefits and drawbacks of wired and wireless networks - identify which devices in their homes are connected to networks	Clear messaging in digital media KNOW THAT: - a brand is a unique design, including logos, fonts, colours and slogans that identifies a product or business - fonts should be clear and easy to read - objects can be added across multiple PowerPoint slides into the exact same position by copy and pasting from one example - using certain terms can improve search engine results KNOW HOW TO: - create a brand that represents an environmental charity - explain why they have chosen certain colours and fonts - use Microsoft Publisher to design a poster	Modelling data using spreadsheets KNOW THAT: - the autofill tool can be used to duplicate cells - there is a difference between data and information - data can be analysed using information from spreadsheets KNOW HOW TO: - how to navigate a spreadsheet via its rows and columns - enter text into cells of a spreadsheet - perform calculations on data using basic formulas and cell references

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8	Mobile app development KNOW THAT: • a variable is something that can be set and changed during the running of a program • mobile apps are programmed using algorithms, which are sets of rules for performing a task • the correct order of programming blocks is essential • dropdowns should be used whenever possible while coding rather than typing in, as it helps avoid errors KNOW HOW TO: • create new screens • insert buttons and add functions • create and set a variable • choose appropriate labels	Computing systems KNOW THAT: • a general-purpose computing system is a device for executing programs • a program is a sequence of instructions that specify operations that are to be performed on data • an operating system is system software that manages computer hardware and software resources KNOW HOW TO: • describe the function of the hardware components used in computing systems • describe how the hardware components used in computing systems work together in order to execute programs	Mug Design KNOW THAT: • lines can be drawn in GIMP with a variety of tools, and some tools are better than others at performing certain tasks such as curves • layers will be displayed in the order stacked, and the top layer must have transparency for anything under to show through • logos should be placed on both ends, so they can always be seen KNOW HOW TO: • crop images • resize images (dimensions/resolution) • draw clean lines with appropriate tools • create transparency around designs • add a new layer • insert an image as the background	Using media - Gaining support for a cause KNOW THAT: • all images, information and text should include the source and meet fair use criteria • layouts should be designed to be suitable for the audience • not all information found online is reliable KNOW HOW TO: • identify key features of a word processor • format a document • critique digital content for credibility • construct a blog using appropriate software • create content for a blog based on credible sources