Manland Primary School-Computing Intent

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	**We are Treasure Hunters** **Pupils will know that:** •You can solve problems using programmable toys **Pupils will learn to:** •Understand that a programmable robot can be controlled by inputting a sequence of instructions. •Develop and record sequences of instructions as an algorithm. •Program a robot to follow their algorithm. •Predict how their programs will work. •Debug programs. **Key Vocabulary:** Algorithm, Bug, Computer, Debug, Input, Logical Reasoning, Output, Program, Robot	**We are TV Chefs** **Pupils will know that:** •You can film the steps of a recipe **Pupils will learn to:** . Break down a process into simple, clear steps (an algorithm). •Use different features of a video camera. •Use a video camera to capture moving images. •Record a video using ground rules for filming. •Edit a video to include an audio commentary. •Develop collaboration skills •Discuss work and think about how it could be improved. **Key Vocabulary:** Abstraction, Algorithm, Audio, Decomposition, Edit, Frame, Narration, Pattern, Storyboard, Video Camera	**We are Digital Artists** **Pupils will know that:** •You can use the iPads to create paintings inspired by the work of famous artists **Pupils will learn to:** • Know how to select and set brushes and colours. •Create artwork in a range of styles on iPads. To use the undo function if mistakes are made and to encourage experimentation. •Use multiple layers in their art. •Transform layers. •Paint on top of photographs. **Key Vocabulary:** Analogue, Effect, Pixel, Stylus, Undo, Zoom, bitmap, transform, digital	**We are Publishers** **Pupils will know that:** •You can create a multimedia eBook about what you enjoy and have achieved **Pupils will learn to:** •Plan a small multimedia eBook. •Choose and import images. •Record audio commentary. Add and format titles and other text. •Think carefully about protecting their privacy. •Respect other people's copyright. •Revise and improve their work. **Key Vocabulary:** Audio, clip art, creative commons, eBook, filter, font, images, multimedia, safe search, speech synthesis, voice dictation	**We are Rhythmic** **Pupils will know that:** • You can create patterns of sounds **Pupils will learn to:** •Record audio on a digital device. •Program sprites to playback recorded audio in ScratchJr. •Program ScratchJr to create repeating rhythms. To explore different effects that can be applied to audio. •Create a repeating percussion pattern using a virtual drum machine. •Experiment with a range of virtual instruments. **Key Vocabulary:** Audio, digital, message. Microphone, MIDI, piano roll, repetition, sample, sequencer, speaker, sprite, track, virtual	**We are Detectives** **Pupils will know that:** • You can work with a set of data on pirates **Pupils will learn to:** •Know how data can be structured as records with fields for information. •Understand how data can be organised into groups and subgroups. •Structure data as a tree. •Organise data into a table. •Filter and search data from tables. **Key Vocabulary:** Database, dataset, field filter, form ,leaf, record, sort, table, tree

	We are Astronauts	We are Game Testers	We are Photographers	We are Safe Researchers	We are Animators	We are Zoologists
Year 2	**Pupils will know that:** •You can programme a sprite to move around the screen. **Pupils will learn to:** •Plan a sequence of instructions to move sprites in ScratchJr. •Create, test and debug programs for sprites in ScratchJr. •Work with input and output in ScratchJr. •Use repetition in their programs. •Design costumes for sprites. **Key Vocabulary:** Abstraction, algorithm, bug, code, debug, event, input, output, parallel processing, program, repetition, scratch, sprite	**Pupils will know that:** • You play games, trying to work out the rules of the game **Pupils will learn to:** •Observe and describe carefully what happens in computer games. •Use logical reasoning to make predictions of what a program will do and test these. •Think critically about computer games. •Create sequences of instructions for a virtual robot to solve a problem. •Work out strategies for playing a game well. •Be aware of how to use games safely and in balance with other activities. **Key Vocabulary:** Abstraction, algorithm, computational thinking, input, output, parallel processing, pattern recognition, remix, repetition, scratch, source code, sprite	**Pupils will know that:** •You can review and edit digital photos **Pupils will learn to :** • Consider the technical and artistic merits of photographs. •Use the iPad camera app. •Take digital photographs. •Review, reject or pick the images they take. •Edit and enhance their photographs **Key Vocabulary:** Adjustment, camera roll, colour value, crop, filter, iCloud, JPEG, pixel, rule of thirds, sensor	**Pupils will know that:** •You can retrieve digital content from the Internet for a particular purpose and use mind mapping software. **Pupils will learn to:** •Develop collaboration skills through working as part of a group. •Develop research skills through searching for information on the Internet. •Think through privacy implications of their use of search engines. •Be more discerning in evaluating online information. •Improve note-taking skills through the use of mind mapping. •Develop presentation skills through creating and delivering a multimedia presentation. **Key Vocabulary:** Bing, creative commons, DuckDuckGo, filter, Google, Google custom search, mind map, presentation, safe search, search engine, Wikipedia	**Pupils will know that:** • You can plan, film and add audio to a stop-motion animation. **Pupils will learn to:** •Know how animation works. •Use storyboards to plan an animation. • Create their own original characters, props and backgrounds for an animation. •Film, review and edit a stop-motion animation. •Record audio to accompany their animation. •Provide constructively critical feedback to their peers. **Key Vocabulary:** Animation, background, character, flipbook animation, frame, media assets, onion- skinning, prop, soundtrack, stage, stop-motion, storyboard.	**Pupils will know that:** • You can organise data, record it on a spreadsheet and create charts **Pupils will learn to:** •Sort and classify a group of items by answering questions. •Collect data using tick or tally charts. •Take, edit and enhance photographs. •Use Google Sheets or Microsoft Excel to produce basic charts. •Record information on a digital map. •Summarise what they have learned in a presentation. **Key Vocabulary:** Binary, binary tree, branching database, classification key, data, database, geolocation data, global position system, pixels, tally charts

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Year 3	We are Programmers	We are Bug Fixers	We Are Presenters	We are Who We Are	We are Co-Authors	We are Opinion Pollsters
	Pupils will know that: • You can create your own animation in Scratch **Pupils will learn to:** •Plan and create an algorithm for an animated scene in the form of a storyboard. •Write a program in Scratch to create the animation, including characters, dialogue, costumes, backdrops and sound. •Review their animation programs and correct mistakes. **Key Vocabulary:** Abstraction, algorithm, bug, code, debug, decomposition, event, iterative development, output, parallel processing, program, repetition, scratch, sequence, sprite, storyboard	**Pupils will know that:** • You can recognise common errors and practice solving them **Pupils will learn to:** •Develop a number of strategies for finding errors in programs. •Build up resilience and strategies for problem solving. •Increase their knowledge and understanding of Scratch. •Recognise a number of common types of bugs in software. **Key Vocabulary:** Abstraction, algorithm, bug, code, debug, event, input, logical reasoning, output, parallel processing, program, repetition, Scratch, sequence, sprite, variable	**Pupils will know that:** • You can create an informative presentation about a topic **Pupils will learn to:** •Develop their web-based research skills. •Structure, prepare and deliver a talk about a given topic or subtopic studied in another curriculum area. •Record a piece to camera. •Edit a movie using static images and green screen footage. •Give constructive, critical feedback on recorded presentations. **Key Vocabulary:** Camera roll, colour value, creative commons, green screen, 'Ken Burns' , pixel, resolution, rushes, search engine	**Pupils will know that:** •You can create a set of presentations for different audiences. **Pupils will learn to:** •Create a number of structured presentations. •Create a narrated presentation. •Consider issues of trust and privacy when sharing information. **Key Vocabulary:** Comments, creative commons, data centre, outline, personal information.	**Pupils will know that:** • You can collaborate to create a mini Wikipedia **Pupils will learn to:** •Understand the conventions for collaborative online work, particularly in wikis. • Be aware of their responsibilities when editing other people's work. •Become familiar with Wikipedia, including potential problems associated with its use. •Practise their research skills. •Write for a target audience using a wiki tool. • Develop collaboration skills. To develop proofreading skills. **Key Vocabulary:** Algoritihm, creative commons, debug, five pillars, hyperlinks, hypertext mark-up language (HTML), Wiki, Wikipedia	**Pupils will know that:** • You can create an online opinion poll **Pupils will learn to:** •Understand some elements of survey design. • Understand some ethical and legal aspects of online data collection. •Use the Internet to facilitate data collection. •Gain skills in using charts to analyse data. • Gain skills in interpreting results. **Key Vocabulary:** Data, data centre, data protection, digital footprint, filter (database) , personal information, survey.

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Year 4	We are Software Developers	We are Makers	We are Musicians	We are Bloggers	We are Artists	We are Meteorologists
	Pupils will know that: • You can create, develop and test you own game **Pupils will learn to :** •Develop an educational computer game using selection and repetition. •Understand and use variables. •Start to debug computer programs. •Recognise the importance of user interface design, including consideration of input and output. **Key Vocabulary:** Algorithm, bug, debug, input, output, program, repeat loop , repetition, scratch, sequence, sprite, variable	**Pupils will know that:** • You can write and test your own micro:bit project **Pupils will learn to:** •Learn about the input – process – output model of computation. •Program using the MakeCode blockbased environment. •Test and debug programs they write, using an on-screen simulator and the micro:bit. •Convert and transfer a program written on screen to the micro:bit. **Key Vocabulary:** Accelerometer, algorithm, Bluetooth, if/else if/else, javascript, LED, makecode, Micro:bit, object, code, run time, simulator, source code, variable	**Pupils will know that:** • You can create your own composition and performance **Pupils will learn to:** •Create a repeating percussion rhythm. •Play music using virtual instruments. •Compose or edit tunes using the piano roll (pitch and duration) tool. •Perform electronic music using pre-recorded loops, and create their own loops. •Create a multi-track composition or performance using multiple instruments. •Give feedback to others on their compositions and performances. **Key Vocabulary:** Beat sequencer, live loops, MIDI, piano roll, ample, stave, touch instrument, tracks, velocity, voice	**Pupils will know that:** • You can create a media-rich blog. **Pupils will learn to:** •Become familiar with blogs as a medium and a genre of writing. •Create a sequence of blog posts on a theme. •Incorporate additional media. •Comment on the posts of others. •Develop a critical, reflective view of a range of media, including text. **Key Vocabulary:** Creative commons, hyperlinks, hypertext mark-up language (HTML), uniform resource locator (URL) web server	**Pupils will know that:** • You can create pieces of geometric art. **Pupils will learn to:** •Develop an appreciation of the links between geometry and art. •Become familiar with the tools and techniques of a vector graphics package. •Develop an understanding of turtle graphics. •Experiment with the tools available, refining and developing their work as they apply their own criteria to evaluate it, and receive feedback from their peers. •Develop some awareness of computer-generated art **Key Vocabulary:** Abstraction, Bitmap, fractal, pixel, repetition, sprite, tessellation, transform, turtle, vector graphics	**Pupils will know that:** • You can take on the role of meteorologists and weather presenters. **Pupils will learn to:** •Understand different measurement techniques for weather – both analogue and digital. •Use computer-based data logging to automate the recording of some weather data. •Use spreadsheets to create charts. •Analyse data, explore inconsistencies in data and make predictions. •Practise using presentation and video software **Key Vocabulary:** Analogue, data, dataset, digital, field, filter (database), form, input, interface, record, sensor, table

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Year 5	We are Game Developers	We are Cryptographers	We are Architects	We are Web Developers	We are Adventure Gamers	We are VR Designers
	Pupils will know that: •You can a plan simple computer game **Pupils will learn to:** •Create original artwork and sound for a game. •Design and create a computer program for a computer game, which uses sequence, selection, repetition and variables. •Detect and correct errors in their games. •Use iterative development techniques. **Key Vocabulary:** Algorithm, background, bug, code, debug. Iterative development, logical reasoning, program, scratch	**Pupils will know that:** • You can investigate early methods of communicating over distances **Pupils will learn to:** •Be familiar with semaphore and Morse code. •Understand the need for private information to be encrypted. •Encrypt and decrypt messages in simple ciphers. •Appreciate the need to use complex passwords and to keep them secure. • Have some understanding of how encryption works on the Internet. **Key Vocabulary:** Cipher, codes, cryptanalysis, cryptography, decrypt, encode, encrypt, message, morse code, semaphore, transmit	**Pupils will know that:** • You can create your own virtual gallery **Pupils will learn to:** •Understand the work of architects, designers and engineers working in 3-D. •Develop familiarity with a simple CAD tool. •Develop spatial awareness by exploring and experimenting with a 3-D virtual environment. • Develop greater aesthetic awareness **Key Vocabulary:** Computer-aided design (CAD), creative commons, photorealistic, render	**Pupils will know that:** • You can create your own website about online safety **Pupils will learn to:** •Know the name and function of components making up the school's network. •Understand how information is passed between the components that make up the Internet. •Understand what the source code for a web page looks like and how it can be edited. •Know how a website can be structured. •Add content to a web page. **Key Vocabulary:** Creative commons, hyperlinks, hypertext mark-up language (HTML), hypertext transfer protocol (HTTP), internet, internet protocol (IP) addresses, network switch, packets of data, protocol, tag, uniform resource locator (URL), web browser, web server, world wide web	**Pupils will know that:** • You can create an interactive, non-linear adventure game. **Pupils will learn to:** •Understand how to plan a non-linear presentation. •Create text as part of a presentation. •Add and edit images in a presentation. •Use hyperlinks for navigation between the slides of a presentation. •Record and add audio narration to a presentation. • Use commenting tools to give feedback on a presentation. **Key Vocabulary:** Abstraction, colour value, creative commons, hyperlink, mp3, pixel, safe search	**Pupils will know that:** • You can create virtual reality and augmented reality of your own **Pupils will learn to:** •Explore real-world and imagined locations in VR. •Create 360° photosphere images. •Link physical objects to digital content using QR codes. •Create their own VR scene. •Program objects and interactions in VR. **Key Vocabulary:** Accelerometer, augmented reality, global positioning system (GPS), google cardboard, photosphere, QR code, share code, stereographic, virtual reality (VR)

Year 6	We are Toy Makers	We are Computational Thinkers	We are Publishers	We are Connected	We are Advertisers	We are AI Developers
	Pupils will know that: • You can make a modification to make a soft toy interactive **Pupils will learn to :** •Understand how computers use stored programs to connect input to output. •Generate and evaluate designs in response to a brief. •Plan a complex project by decomposing it into smaller parts. •Work with physical components of a system. •Design and write a program for an embedded system. •Use criteria to provide others with feedback on their work **Key Vocabulary:** Accelerometer, Bluetooth, controller, decomposition, edge connector, embedded system, input, interactive, light-emitting diode (LED), makecode, micro:bit, microprocessor, output, simulator, system	**Pupils will know that:** •You can participate in some hands-on unplugged activities **Pupils will learn to:** •Develop the ability to reason logically about algorithms. •Understand how some key algorithms can be expressed as programs. •Understand that some algorithms are more efficient than others for the same problem. •Understand common algorithms for searching and sorting a list. **Key Vocabulary:** Abstraction, algorithm, binary search, decomposition, divide and conquer, graph, greedy algorithm, linear search, quicksort, search, search algorithm, selection sort, sort	**Pupils will know that:** • You can produce a class year book or school magazine **Pupils will learn to:** •Manage or contribute to large collaborative projects, facilitated using online tools. •Write and review content. •Source digital media while demonstrating safe, respectful and responsible use. •Design and produce a high-quality print document. **Key Vocabulary:** Creative commons, desktop publishing (DTP), eBook, ePub, folder, image, portable document format (PDF), text	**Pupils will know that:** • You can use a school blogging platform to explore issues related to social media **Pupils will learn to:** •Understand appropriate rules or guidelines for a civil online discussion. •Explore how search results are selected and ranked. •Argue their point effectively, supporting their views with sources. •Counter someone else's argument while showing respect and tolerance. •Judge the reliability of an online source. •Develop some strategies for dealing with online bullying **Key Vocabulary:** Anchor tag bias, blog, fake news, hyperlink, netural point of view, online bullying (cyberbullying) plausible, reliable, social media, source	**Pupils will know that:** • You can shoot and edit a final version of an advert **Pupils will learn to:** •Think critically about how video is used to promote a cause. •Create a storyboard for an effective advert for a cause . • Work collaboratively to shoot original footage and source additional content. • Acknowledge intellectual property rights. • Work collaboratively to edit the assembled content to make an effective advert. **Key Vocabulary:** Creative commons, export, final cut, rough cut, rushes, storyboard	**Pupils will know that:** •You can program a self-driving car and consider the ethics of AI **Pupils will learn to:** •Understand how decision trees can be trained automatically to classify data. •Show how speech recognition works. • Explore how a neural net recognises images. • Train a neural net to classify images. • Train a machine learning system to identify sentiments. • Consider some ethical principles in designing AI systems. **Key Vocabulary:** Artificial intelligence, classifier, decision tree, image recognition, label, layer, machine learning, model, natural language processing, neural network, node, sentiment analysis, spectrogram, speech recognition, test data, training data, Watson.