

COMPUTING

Computing Progression Map

	Knowledge	Key Vocabulary	Links to prior Learning	Links to Future Learning
Reception Autumn 1 st half term	<u>Early Learning Goal</u> During the Autumn term it is important that children begin to learn the importance of rules. Understanding how right and wrong impacts on these rules and why it can be important for a rule to be followed.	Right, wrong, rule, consequence.	Reception children will have been introduced to what rules are within their year at nursery.	
Reception Autumn 2 nd half term				
Reception Spring 1 st half term	<u>Early Learning Goal</u> During the Spring Term the children need to build their confidence to try new and unique activities in preparation for Summer Term Children need to understand how to safely use and explore new materials and tools. This could involve being introduced to different technologies such as an iPad.	New, tool, material,	Reception children will have been introduced to activities that will have developed their fine motor skills and how they use these tools safely.	

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Reception Spring 2 nd half term				
Reception Summer 1 st half term	<u>Computer Science</u> <i>Pre Teaching – All Year Groups Pre Coding Unit</i> What is Computer Science? <u>Software – Robot STEM Mouse</u> I can learn and understand the definitions of programmer, algorithm, code and debug. I can write an algorithm to move my partner who is playing a robot from one cone to another. I can program a STEM robot mouse using an algorithm to move from one object to another. I can program a STEM robot mouse using an algorithm to complete a maze. All definitions and how to teach these areas of computing are within the teaching documents and slides I have prepared on Teams.	Computer Science Programmer, Code, Algorithm, Debug, , (All definitions in teaching slides and will be part of what will be assessed in pupil voice and app based questionnaires)		<u>Yr 1- Computer Science Software – Robot STEM Mouse Unit</u> <u>Yr 1 Computer Science Software – Kodable Unit</u> <u>Yr 2 Computer Science Software – Kodable Unit</u>
Reception Summer 2 nd half term				

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	Knowledge	Key Vocabulary	Links to prior Learning	Links to Future Learning
Year 1 Autumn 1 st half term	<u>Computer Science</u> <i>Pre Teaching – All Year Groups Pre Coding Unit</i> What is Computer Science? <u>Software – Robot STEM Mouse</u> I can learn and understand the definitions of programmer, algorithm, code and debug. I can write an algorithm to move my partner who is playing a robot from one cone to another. I can program a STEM robot mouse using an algorithm to move from one object to another. I can program a STEM robot mouse using an algorithm to complete a maze. All definitions and how to teach these areas of computing are within the teaching documents and slides I have prepared on Teams.	Computer Science Programmer, Code, Algorithm, Debug, , (All definitions in teaching slides and will be part of what will be assessed in pupil voice.)	Year 1 Children will be coming from experiences in Foundation of using physical robots that are a BeeBot style. So they will have programmed the robot using algorithms and making sure the order is in the correct sequence. Therefore, they will understand what programming with an algorithm will look like	<u>Yr 1 Computer Science Software – Kodable Unit</u> <u>Yr 2 Computer Science Software – Kodable Unit</u>
AI Lesson Strand	Learn It: What is AI? To understand what AI means in simple terms.			
Year 1 Spring	<u>Computer Science</u>	Technology Computer	Children will have had exposure to digital technology	Yr 3 – Creating Media

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1 st half term	<u>Systems and Networks</u> 1 Technology around us 2 Using technology 3 Developing mouse skills 4 Using a computer keyboard 5 Developing keyboard skills 6 Using a computer responsibly	Mouse Keyboard Monitor Computer File Username Password	and what it is, but for many this will be a new experience to support their use of Laptops, physical keyboards and digital files.	
AI Strand Lesson	Question It: AI or not AI? To recognise the difference between AI and non-AI technologies.			
Year 1 Summer 1 st half term	<u>Computer Science</u> <i>All Year Groups Pre Coding Unit</i> What is Computer Science? <u>Software – Kodable</u> <u>Revising all skills from the Autumn</u> I can write a set of instructions using the correct sequence to complete an algorithm. I can write a set of instructions and put some conditions into the sequence of the algorithm. I can write a set of instructions and use a loop to shorten the sequence of the algorithm.	Computer Science Programmer, Code, Algorithm, Debug, Software, Hardware, Condition (If/Then), Loop (All definitions in teaching slides and will be assessed in pupil voice)	Year 1 Children will be coming from experiences in Foundation of using physical robots that are a BeeBot style. So they will have programmed the robot using algorithms and making sure the order is in the correct sequence. Therefore, they will understand what programming with an algorithm will look like.	<u>Yr 2</u> <u>Computer Science</u> <u>Software – Kodable</u> <u>Unit</u>

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	All definitions and how to teach these areas of computing are within the teaching documents and slides I have prepared on Teams.			
AI Strand Lesson	Secure It: Staying safe around AI. To learn simple ways to stay safe when using AI devices.			

	Knowledge	Key Vocabulary	Links to prior Learning	Links to Future Learning
Year 2 Autumn 1 st half term	<u>Computer Science</u> <i>Pre Teaching – All Year Groups Pre Coding Unit What is Computer Science?</i>	Computer Science Programmer, Code, Algorithm, Debug,	Year 2 children will have had some exposure to the subject specific language is being taught during their time in Year 1 and had the	<u>Yr 3 Computer Science Software – Scratch JR</u>

	<u>Software – Code.Org</u> <u>All of the below will be achieved on Code.org. This exposes the children to basic block coding in preparation for Scratch Jr in Year 3.</u> I can write a set of instructions using the correct sequence to complete an algorithm. I can write a set of instructions and put some conditions into the sequence of the algorithm. I can write a set of instructions and use a loop to shorten the sequence of the algorithm. All definitions and how to teach these areas of computing are within the teaching documents and slides I have prepared on Teams.	Software, Hardware, Condition (If/Then), Loop (All definitions in teaching slides and will be part of what will be assessed in pupil voice)	opportunity to use and apply this on the Software Application Kodable. The progression is now that the children will apply these skills to block coding in preparation for Scratch Jr in Year 3	I can write algorithms that use a set of sequences that create a game with conditions, rules and loops.
Year 2 Autumn 2nd half term	Learn It: AI is not human To understand that AI is a tool, not a person and it doesn't have feelings or intentions.			
Year 2 Spring 1st half term	<u>Computer Science</u> <u>Pictograms and Data</u> 1 Counting and Comparing 2 Enter The Data	Technology Computer Data Pictogram Tally Chart	Children will have had exposure to use of desktop or laptop computers in Year during their system and networks	<u>Yr 3 – Creating Media</u>

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	3 Creating Pictograms 4 What is an attribute 5 Comparing People 6 Presenting Information		strand. They will have learnt about files, keyboards, and the mouse.	
Year 2 Spring 2 nd half term	Learn It: Fun with AI To explore simple AI tools and reflect on what we've learned about AI.			
Year 2 Summer 1 st half term	<u>Computer Science</u> <i>Pre Teaching – All Year Groups Pre Coding Unit</i> What is Computer Science? <u>Software – Robot STEM Mouse</u> I can revise and understand the definitions of programmer, algorithm, code and debug through different tasks. I can program a STEM robot mouse to achieve different outcomes using different algorithms. I can reflect and explore how looping could improve the STEM robot mouse. All definitions and how to teach these areas of computing are within the teaching documents and slides I have prepared on Teams.	Computer Science Programmer, Code, Algorithm, Debug, Software, Hardware, Condition (If/Then), Loop (All definitions in teaching slides and will be part of what will be assessed in pupil voice)	Year 2 children will have had some exposure in two previous units and Foundation and Year 1 on how to use algorithms with STEM robot mice..	<u>Yr 3 Computer Science Software – Scratch JR</u> I can write algorithms that use a set of sequences that create a game with conditions, rules and loops.

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Year 2 Summer 2 nd half term	Question It: How does AI work? To explore how AI learns from data and patterns and understand that AI can make mistakes			
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	Knowledge	Key Vocabulary	Links to prior Learning	Links to Future Learning
Year 3 Autumn 1 st half term	<u>Computer Science</u> <i>Pre Teaching – All Year Groups Pre Coding Unit</i> What is Computer Science? <u>Software – Scratch JR</u> I can write algorithms that use a set of sequences that create a game with conditions, rules and loops. All definitions and how to teach these areas of computing are within the teaching documents and slides I have prepared on Teams.	Computer Science Programmer, Code, Algorithm, Debug, Software, Hardware, Condition (If/Then), Loop, Block Coding. (All definitions in teaching slides and will be part of what will be assessed in pupil voice)	Year 3 children will have learnt the subject specific language during their time in Key Stage 1 that will continue to be studied this year. Year 3 however will accelerate their learning by applying the terms and knowledge they have to build more complex algorithms that achieve a desired outcome. Scratch Jr provides a blank canvas that is a far greater challenge than Kodable for creating their own code and opens up far more opportunity for creativity.	<u>Yr 4</u> <u>Computer Science</u> <u>Software – Scratch JR</u> I can build a game using logical thinking to ensure the simplest and most efficient algorithms are used.

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AI Strand	Question It: AI's Brain: Data and Patterns To understand how AI uses data and patterns to learn and make decisions.			
Year 3 Spring 1 st half term	<u>Computer Science</u> <u>Stop Frame Animation</u> 1) Can A Picture Move? 2) Frame by Frame 3) What's the story? 4) Picture Perfect 5) Evaluate and make it great. 6) Lights Camera Actions Application Lego Movie Maker	Sequence Animation Frame Stop Frame Animation Storyboard	Children in Year 3 would have covered the previous content that has been separated from coding to offer wider breadth of knowledge; Year 1 – Systems and Networks and different parts of the computer. Year 2 – Presenting data and using pictograms. These don't cover all the same information but introduce what digital technology can be used for.	YR 6 Creative Media
AI Strand	Question It: Meet AI To learn how AI uses data to make decisions and understand its uses in daily life.			
Year 3 Summer 1 st half term	<u>Computer Science</u> <i>Pre Teaching – All Year Groups Pre Coding Unit</i>	Computer Science Programmer, Code, Algorithm, Debug,	Year 3 children will have learnt the subject specific language during their time in Key Stage 1 that will continue to be	<u>Yr 4</u> <u>Computer Science</u> <u>Software – Scratch</u> <u>JR</u>

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	What is Computer Science? <u>Software – Scratch JR</u> I can build an 'avoid the object' game by writing a number of different algorithms that will use sequences, conditions, looping and variation. All definitions and how to teach these areas of computing are within the teaching documents and slides I have prepared on Teams.	Software, Hardware, Condition (If/Then), Loop, Block Coding. (All definitions in teaching slides and will be part of what will be assessed in pupil voice)	studied this year. Year 3 however will accelerate their learning by applying the terms and knowledge they have to build more complex algorithms that achieve a desired outcome. Scratch Jr provides a blank canvas that is a far greater challenge than Kodable for creating their own code and opens up far more opportunity for creativity.	I can build a game using logical thinking to ensure the simplest and most efficient algorithms are used.
Ai Strand	Secure It: AI and Privacy To learn why protecting personal data is important and how to interact safely with AI tools.			

	Knowledge	Key Vocabulary	Links to prior Learning	Links to Future Learning
Year 4 Autumn 1 st half term	<u>Computer Science</u> <i>Pre Teaching – All Year Groups Pre Coding Unit</i> What is Computer Science? <u>Understanding the Computer Units Of Study</u> 1) What is a computer?	Input, Storage, Processing, Output, Computer, Computer Network, Internet, World Wide Web, Search Engine (All definitions in teaching slides and will be part of what	This is a new unit of study for this year. It is a deep dive in to how the technology that the children use works. They will have had exposure in previous years to using computers, Ipads and	<u>Yr 6</u> <u>Computer Science</u> <u>Continued Study on Understanding the Computer</u>

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	Explanation for this within slides and main teaching point is Input, Storage, Processing, Output. <u>2) What is a computer network?</u> Children need to understand from slides that a network connects computers and links to internet. <u>3) What is the world wide web?</u> The children need to understand that the world wide web is a collecting of webpages hyperlinked together. They need to understand the difference compared to the internet. <u>4) What is a search engine?</u> Understand the mechanics of how search engines filter pages.	will be assessed in pupil voice)	other examples of hardware and software. However, they have not yet has explicit teaching of how these systems work.	
Ai Strand	Question It: Can AI make mistakes? To understand that AI can make mistakes and why it's important to check its answers.			
Year 4 Spring 1 st half term	<u>Computer Science</u> <i>Pre Teaching – All Year Groups Pre Coding Unit</i> What is Computer Science? <u>Software – Scratch JR</u> I can build a game using logical thinking to ensure the simplest and most efficient algorithms are used.	Computer Science Programmer, Code, Algorithm, Debug, Software, Hardware, Condition (If/Then), Loop Block Coding. (All definitions in teaching slides and will be part of what will be assessed in pupil voice)	Year 4 children have been introduced to Scratch JR in the previous years teaching. They will have applied the subject specific language to help them build projects within the software program they have been using. The units of study within Scratch Jr in Year 4 will further expose them to challenges involving their understating and will give them more opportunity to add more algorithms to their work with less support than the	<u>Yr 5</u> <u>Computer Science</u> <u>Software – Scratch Full</u> I can build an algorithm that incorporates a sequence, conditional statement and a loop to achieve an outcome.

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	All definitions and how to teach these areas of computing are within the teaching documents and slides I have prepared on Teams.		scaffolding they would have been given in Year 3.	
Ai Strand	Question It: AI Ethics: Fair or unfair? To understand that AI can be biased and why fairness is important in AI decisions			
Year 4 Summer 1 st half term	<u>Computer Science</u> Pre Teaching – All Year Groups Pre Coding Unit What is Computer Science? <u>Software – Codey Rocky</u> I can revise and understand the definitions of programmer, algorithm, code, and debug. I can write an algorithm to program my Codey Rocky to move. I can program a conditional statement to enable the hardware buttons run my software. I can program a STEM robot mouse using an algorithm to complete a maze. All definitions and how to teach these areas of computing are within the teaching documents and slides I have prepared on Teams.	Computer Science Programmer, Code, Algorithm, Debug Hardware Save File (All definitions in teaching slides and will be part of what will be assessed in pupil voice.)	Year 4 children have had experiences with Robots in Year 1 and 2. They have had experience coding using Scratch Jr software in Year 3 and earlier in Year 4 which will support them in programming the software.	<u>Yr 5 – Mbot Strand</u> <u>Yr6 – Mbot Strand</u>

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A.i Strand	Think It: Designing my own AI. To design a helpful and fair AI tool that solves a simple problem.			
	Knowledge	Key Vocabulary	Links to prior Learning	Links to Future Learning
Year 5 Autumn 1 st half term	<u>Computer Science</u> <i>Pre Teaching – All Year Groups Pre Coding Unit What is Computer Science?</i> <u>Software – Scratch Full</u> I can build an algorithm that incorporates a sequence, conditional statement and a loop to achieve an outcome. All definitions and how to teach these areas of computing are within the teaching documents and slides I have prepared on Teams.	Computer Science Programmer, Code, Algorithm, Debug, Software, Hardware, Condition (If/Then), Loop (All definitions in teaching slides and will be part of what will be assessed in pupil voice)	Year 5 children will have learnt the subject specific language during their time in Key Stage 1 and Lower Key Stage 2 that will continue to be studied this year and next. Year 5 however will again accelerate their learning by applying the terms and knowledge they have to build more complex algorithms than those they would have used in Lower Key Stage 2 to achieve a desired outcome. Scratch is considerably more advanced than Scratch in terms of vastness of code that can be used provides and provides a far greater challenge than Scratch Jr for creating their own code as it opens up more complex language linked to the block coding they are doing. An example of this would be that rather than inputting coding such as 'Turn Left' they would need to build an algorithm that instructs something to turn 90 degrees anti clockwise on the x axis.	<u>Yr 6 Computer Science Software – Scratch Full</u> I can build an algorithm that incorporates a sequence, conditional statement and a loop to achieve an outcome

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Ai Strand	Question It: Exploring the AI world To understand the role of AI in everyday life including its benefits and challenges.			
Year 5 Spring 1 st half term	<u>Computer Science</u> <i>Pre Teaching – All Year Groups Pre Coding Unit</i> What is Computer Science? <u>Software – MBot</u> I can revise and understand the definitions of programmer, algorithm, code, and debug. I can understand what a motor is, how it works and how to connect one. I can understand what a Sensor is, how it works and how to connect one. I can understand what a Motherboard is, how it works and how to connect one. I can code a robot with algorithms.	Computer Science Programmer, Code, Algorithm, Debug Hardware Motor Sensor Motherboard (All definitions in teaching slides and will be part of what will be assessed in pupil voice.)	Year 5 children have had experiences with Robots in Year 1, 2 and Year 4. They have had experience coding using Scratch Jr software in Year 3 and in Year 4 which will support them in programming the software. They have also used MBot software in Year 4.	<u>Yr6 – Mbot Strand</u>
Ai Strand	Question It: Data Detectives To explore how AI collects and uses data, including the impact of poor-quality data.			
Year 5 Summer	<u>Computer Science</u>	Computer System Search Engine	Children in Year 5 would have covered the previous content that has been	YR 6 Spreadsheets

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1 st half term	<u>Understanding the Computer Systems and Searching</u> 1) Systems 2) Computer Systems and Us 3) Searching the web 4) Selection Search Results 5) How search results are ranked 6) How are search results influenced.	World Wide Web Webpage Search Engines	separated from coding to offer wider breadth of knowledge; Year 1 – Systems and Networks and different parts of the computer. Year 2 – Presenting data and using pictograms. Year 3 – Stop motion animation. These don't cover all the same information but introduce what digital technology can be used for.	
AI Strand	Secure It: Privacy in an AI world. To learn how AI collects personal data and why privacy is important.			
	Knowledge	Key Vocabulary	Links to prior Learning	Links to Future Learning
Year 6 Autumn 1 st half term	<u>Computer Science</u> <u>Data and Information</u> <u>Introduction to Spreadsheets</u> 1) Collecting Data 2) Formatting a spreadsheet 3) What's the formula? 4) Calculate and Duplicate	Data Spreadsheet Formula Operation	Children in Year 5 would have covered the previous content that has been separated from coding to offer wider breadth of knowledge; Year 1 – Systems and Networks and different parts of the computer. Year 2 – Presenting data and using pictograms. Year 3 – Stop motion animation.	

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	5) Event Planning 6) Presenting Data		These don't cover all the same information but introduce what digital technology can be used for.	
A.i Strand	Build It: Building a better AI. To design an AI tool with a focus on fairness, safety, and responsibility.			
Year 6 Spring 1 st half term	<i>All Year Groups Pre Coding Unit</i> What is Computer Science? <u>Computer Science</u> <u>Software – Scratch Full</u> I can build an algorithm that incorporates a sequence, conditional statement and a loop to achieve an outcome All definitions and how to teach these areas of computing are within the teaching documents and slides I have prepared on Teams.	Computer Science Programmer, Code, Algorithm, Debug, Software, Hardware, Conditional Statement (If/Then), Loop, Block Coding. (All definitions in teaching slides and will be part of what will be assessed in pupil voice)	Year 6 children will have learnt the subject specific language during their time in Key Stage 2 that will continue to be studied this year. Year 6 children have been introduced to Scratch in the previous years teaching. They will have applied the subject specific language to help them build projects within the software program they have been using. The units of study within Scratch in Year 6 will further expose them to challenges involving their understating and will give them more opportunity to add more algorithms to their work with less support than the scaffolding they would have been given in Year 5.	Key stage 3 - Aims - To 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 - To use 2 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
A.i Strand	Mind It: AI and Bias.			

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	To understand how AI can be biased and its impact on fairness.			
Year 6 Summer 1 st half term	Computer Science <i>Pre Teaching – All Year Groups Pre Coding Unit</i> What is Computer Science? Software – MBot I can revise and understand the definitions of programmer, algorithm, code, and debug. I can revise what a motor is, how it works and how to connect one. I can revise what a Sensor is, how it works and how to connect one. I can revise what a Motherboard is, how it works and how to connect one. I can solve different STEM challenges with my robot to demonstrate the coding I have learned across Montgomery's Computing curriculum.	Computer Science Programmer, Code, Algorithm, Debug Hardware Motor Sensor Motherboard (All definitions in teaching slides and will be part of what will be assessed in pupil voice.)	Year 6 children have had experiences with Robots in Year 1, 2, 4 and Year 5. They have had experience coding using Scratch Jr software in Year 3 and in Year 4 which will support them in programming the software. They have also used MBot software in Year 4.	Key stage 3 - Aims - To 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 - To use 2 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
A.i Strand	Mind It: AI and Bias. To understand how AI can be biased and its impact on fairness.			