Computing Intent and Coverage LTP

Purpose of Study [from National Curriculum]:
A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

Whitecote Curriculum Intent Statement:
Our computing curriculum encourages pupils to become digitally literate so they can use technology to confidently express their ideas in ways that are safe, collaborative and refinable. Our computer curriculum develops pupils' computational thinking, as well as equipping them with the skills and knowledge to express their creativity through digital means. Pupils learn how technology can be used to solve problems and achieve specific goals faster, efficiently and in way that cannot be replicated through conventional means. In developing their knowledge of computer science, they will gain an understanding of how the digital word works and how it can be used to create programs, systems and a range of content. In this way, we prepare our pupils to be safe, productive and reasonable digital citizens.

Aims [from National Curriculum]:	Whitecote Way [School Context]
• can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation • can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems • can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems • are responsible, competent, confident and creative users of information and communication technology.	

Subject Core Concepts	Suggested Cognitive Strategies
The core concepts, taken from the aims of the curriculum, will be used to inform suggested sequences of learning and focus the learners on the principle aims of effective subject-specific understanding: • Control • Algorithms and sequenced instruction • Procedural thinking • Repetition / Loops, Conditionals / Selection and Variables • Data	The Whitecote cognitive strategies are suggested strategies that might be used across the subject's curriculum to allow them to internalise and retain knowledge. These will be modelled during CPD: • **Connect** to something that is already known, i.e., algorithm for making a sandwich • Use objects to **make it concrete**, e.g., pattern spotting, roamers, control physical systems • **Physically Do It** by acting out instructions with repetition, selection, etc. • **Teach It** (Rubber Duck Debugging) describing to a rubber duck everything the code is meant to do at each stage and spot where it has gone wrong

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Subject Core Concepts	Suggested Cognitive Strategies
• Abstraction • Logic • Input > Process > Out put • Decomposition • Debugging	• **Draw a Picture or Diagram** to show what will happen in what order • **Dual Code** words with pictures to remember specific instructions or components • **Order** instructions and commands as part of logical, algorithm sequencing

	National Curriculum	Additional Knowledge
EYFS	N/A	In addition, Whitecote pupils will be taught: •
Key Stage 1	Pupils should be taught to: • 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 • use technology purposefully to create, organise, store, manipulate and retrieve digital content • recognise common uses of information technology beyond school • 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.	In addition, Whitecote pupils will be taught: •
Key Stage 2	Pupils should be taught to: • 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 • 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	In addition, Whitecote pupils will be taught: •

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	National Curriculum	Additional Knowledge
	• 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.	

Topic Coverage per Year Group				
Year Group	**Autumn**		**Spring**	**Summer**
Nursery	Interactive Whiteboard Games		Interactive Whiteboard Games	Interactive Whiteboard Games
Reception	Interactive Whiteboard Games		Technology: Old and New Digital Painting Interactive Whiteboard Games Talking Tins Recording	Computer Coding and Algorithms, inc. BeeBots Interactive Whiteboard Games
1	Online Safety: Web and Password Security Logging-on	Grouping and Sorting	Computer Coding and Algorithms, inc. BeeBots World Wide Web, Internet & Research	Spreadsheets Technology out of School Music ICT
2	Computer Coding and Algorithms Grouping		Computer Coding and Algorithms	Spreadsheets Technology out of School
3	Computer Coding and Algorithms World Wide Web, Internet & Research, inc. interpretation of potential result bias Bronze Age Minecraft Data Collection and Spreadsheets		Computer Coding and Algorithms Word Processing and Report Writing E-Mail	Computer Coding and Algorithms Databases - *Animals* Word Processing and Report Writing

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Topic Coverage per Year Group			
Year Group	**Autumn**	**Spring**	**Summer**
	Geographical Fieldwork		
4	Computer Coding and Algorithms Computer-Aided Design – Ancient Architecture Build an ancient monument	Computer Coding and Algorithms World Wide Web, Internet & Research, inc. interpretation of potential result bias Word Processing and Report Writing	Computer Coding and Algorithms Communication, inc. Conference Calling and E-Mail
5	Computer Coding and Algorithms • Scratch[???] Data Collection and Spreadsheets *Geographical Fieldwork*	Planning, Designing, Sketching Computer-Aided Design – Ancient Architecture – Castle-Age Making, Evaluating, Improving	Planning, Designing, Sketching Computer-Aided Design – Ancient Architecture Making, Evaluating, Improving
6	Computer Coding and Algorithms Communication, inc. Conference Calling and E-Mail	Blogging Text Adventures	Computer Coding and Algorithms • *Links to WWII Enigma Machine* Quizzing Networks

	Sequence of Learning	
#	**Phase**	**Explanation**
1	**Prediction:**	Look at existing examples: *Can you predict what this program will do? How do you know? Do you know what any of the commands mean?* Test predictions to see if they are correct.
2	**Analyse:**	Based on these examples: *How does the example software work?* Map it out. List variables, etc. Pupils experiment by making changes to the code and predict what will happen when they run it. *Can they break it and fix it?*

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	Sequence of Learning	
#	**Phase**	**Explanation**
3	**Audience and Purpose:**	Consider who the product is for and what it aims to achieve. *What needs to be achieved? Who is it designed for?* Design success criteria.
4	**Plan:**	Plan variables, elements of code, graphics, different screens / levels, instructions for users. Evaluate plans independently and collaboratively against success criteria. Suggest improvements to plan and determine when review will take place.
5	**Teach:**	Learn new skills and knowledge needed to inform the finished product.
6	**Debug:**	Break the example in various ways and challenge pupils to debug examples to what out what is going wrong.
7	**Write:**	Write code based on plan. Test that it works.
8	**Evaluation:**	Run through software and evaluate against the success criteria set out in the audience and purpose phase.

Tier 2 Vocabulary						
Children need to know, understand and use the relevant vocabulary for their age group by the end of the year and will be provided with opportunity throughout the year. This list is cumulative and should be revisited and built upon each year.						
Reception	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Code	Program	Debug	Algorithm			

Useful Websites

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