

WHITMORE PARK PRIMARY SCHOOL COMPUTING CURRICULUM



Whitmore Park Primary School



Contents

Curriculum Drivers
Whole school links4
Pupil Offer5
Computing Intent
End of Key Stage 1 Expectations7
End of Key Stage 2 Expectations9
Whole School Year Plan for Computing
Cross Curricular Links
Digital Literacy whole school skills progression and knowledge
Computer Science whole school skills progression and knowledge
Information Technology school skills progression and knowledge14
Implementation15



Our Curriculum Drivers

Our Curriculum drivers thread throughout our whole curriculum.



						5	Whitmore Park
Year Group		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Pranaey2Schoo
	Humanities	Transport		Victo	ctorians My School		Local Area
1	Science	Materials		Plants	Trees	Senses	
	Trips/Visits	Transport Museum + Stage Coach Visitor Twycross Zoo					
2	Humanities	Lady Godiva	Great Fire of London	United Kingdom	Name Continents Of The World	The Queen	World Geography inc. Local Area
	Science	Animals	Materials	Materials	Plants	Living Things and Their Habitats	
	Trips/Visits		Selly Manor				Conkers
	Humanities	Stone Age to Iron Age	Romans	Romans	Saxons	Local Area and UK Geography	
3	Science	Light	Rocks	Forces and Magnets	Animals	Plants	
	Trips/Visits	Coombe Abbey Roman V		isitor	Saxon Visitor	Coundon Wedge + Jubilee Crescent	
	Humanities	Egyptians		Vikings	Coventry	South America	
4	Science	States of Matter		Sound	Electricity	Living Things	Animals including Humans
	Trips/Visits	Egyptian Visitor			City Centre Field Trip		
	Humanities	Coventry Blitz		Volcanoes and Earthquakes	Europe and Barcelona	Ancient	Greeks
5	Science	Properties and Changes of Materials		Living Things and Their Habitats		Forces	Earth and Space
	Trips/Visits	Transport Museum	Herbert Art Museum				
	Humanities	Mayans				Crime and Punishment	Rivers
6	Science	Animals including Humans		Evolution and Inheritance			
	Trips/Visits	Science Visitor	Mayan Visitor	Holes (Theatre)			



Whitmore



Computing Intent

At Whitmore Park we strive to develop independent learners who are well equipped for the digital age. Our Computing curriculum provides pupils with inspirational and engaging real life experiences that develop a range of Information Technology skills and knowledge that will be vital in the job market of the future. The Computing curriculum is designed to enable pupils to understand the fundamental principles of Computer Science, including using logical reasoning, algorithms and data analysis and presentation. It also ensures that all pupils have the level of digital literacy required to express their ideas creatively, responsibly and with confidence, something that is essential when navigating a digital world. The way the curriculum is designed ensures that each year pupil knowledge and skills are built upon and expanded. This is done by introducing new learning and concepts each academic year as well as revisiting, consolidating and enhancing learning that has been done in previous years. This allows all pupils to be well prepared and confident for the next stage in their educational journey. At Whitmore Park, pupils experience Computing both discretely, and where appropriate, thematically through other subject areas. When Computing is taught discretely it is taught by a specialist teacher, pupils can then revisit and apply the skills they have learnt across the curriculum with their class teachers. This ensures teaching is of a high quality and that pupils can apply their knowledge in different ways away from the point of learning. Pupil voice is also an important aspect of our curriculum design. Each year a mix of pupils from each Key Stage are interviewed about Computing. They are asked about what they enjoy, think is important and what they would like to do more of in Computing. This information is then taken into consideration by the Senior Leadership team and subject leads and where appropriate implemented. Regular teacher assessment is deployed throughout the different strands to certify our curriculum stays relevant to our pupils' needs and provides them with the next step in their learning.



Curriculum Drivers in Computing

Vocabulary

Vocabulary is given a prominent place with computing lessons ensuring technical vocabulary is used and applied in an age-appropriate manner. Technical vocabulary is displayed on flip charts with definitions or symbols for pupils to refer to. Technical vocabulary is also reinforced and revisited using low stakes quizzing apps, such as Kahoot.

Inclusion

Inclusion is encouraged in a variety of ways in computing lessons. SEN and Pupil Premium pupils are targeted by class teachers for additional support and questioning in lessons. In addition to this, where it is deemed appropriate, SEN and Pupil Premium pupils are given first access to any computing clubs and any organised trips. Also, by providing an after-school computing club to pupils we are providing resources and additional opportunities to pupils who may not have access to such technology at home. As previously mentioned, differentiation is provided in a range of ways to ensure all pupils are given the opportunity to succeed. As in other areas of the curriculum, assistive technology, such as screen readers and voice dictation, as well as more computing specific technologies such as coding video tutorials, allow all pupils to access the curriculum.

Diversity

The curriculum takes several approaches to encourage diversity within the classroom. Firstly, the curriculum is a creative and inclusive one. By providing a structured and differentiated program of learning, all pupils, regardless of gender, ethnicity or class are enabled to succeed. By having a broad computing curriculum and not just one that promotes computer science gives pupils a better understanding of what Computing is and how it can be relevant to them. Another way that diversity is promoted is through the equal opportunity for learning, all pupils are encouraged, support and challenged equally. Care has



been taken when planning topics for that curriculum that they appeal to both genders. As well as this, a diverse group of role models are promoted to children to foster a sense that computing is for all.

First Hand experiences

School leaders have made great progress in securing high quality IT equipment throughout the school. School leaders have also offered support and training for teachers in the use of that technology so it can be deployed in an effective and meaningful way. Leaders have thought carefully about the use of applications within the curriculum to allow pupils to experience a range of interesting and engaging learning opportunities. Where appropriate and possible there will be chances for pupils to go on Computing trips, workshops and visitors, for example the planned Year 5 Amazon Future Engineers workshop that will help to enhance the curriculum for pupils.

Oracy (Speaking + Listening)

Within lessons pupils take part in range of speaking and listening activities. Pupils are challenged to listen to, question and respond to their partner's ideas through talk partner activities as well as explain their own thinking throughout the different Computing areas.



End of Key Stage 1 Expectations

Our computing curriculum is split into 3 strands; Computer Science, Digital Literacy and Information Technology. Following the National Curriculum for Computing, our curriculum is designed to ensure all pupils are taught to:

- Computer Science (CS)
 - Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following a precise sequence of instructions.
 - Create and debug simple programs
 - Use logical reasoning to predict and computing the behaviour of simple programs.
- Information Technology (IT)
 - Use technology purposefully to create, organise, store, manipulate and retrieve digital content.
- Digital Literacy (DL)
 - \circ $\$ 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.

End of Key Stage 2 Expectations

• Computer Science

- 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; generate appropriate inputs and predicted outputs to test programs
- o Use logical reasoning to explain how a simple algorithm works 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
- Appreciate how (search results are selected and ranked).
- Information Technology
 - 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 search technologies effectively.
- Digital Literacy
 - Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact
 - Be discerning in evaluating digital content; respect individuals and intellectual property; use technology responsibly, securely and safely
 - \circ Understand the opportunities networks offer for communication and collaboration.



Whole School Year Plan for Computing

Year Group	Autumn 1	Autumn 2	Spring 1 (Includes Internet Safety Day)	Spring 2	Summer 1	Summer 2
1	<u>Digital Literacy</u>	Computing Systems and Networks (IT) Technology around us	<u>Creating Media (IT)</u> Digital painting	<u>Creating Media (IT)</u> Digital writing	<u>Computer Science</u> Moving a robot	Computer Science Introduction to animation with Scratch Jr
2	Digital Literacy	<u>Computing Systems</u> <u>and Networks (IT)</u> IT around us	<u>Computer Science</u> Robot algorithms	Computer Science An introduction to quizzes with Scratch Jr	<u>Creating Media (IT)</u> Photography	Data and Information (IT) Pictograms
3	Digital Literacy		<u>Computer Science</u> Sequences in music with Scratch			<u>Creating Media (IT)</u> Animation with iMotion and iMovie
4	<u>Digital Literacy</u>		<u>Computer Science</u> Repetition in shapes with Logo			Creating Media (IT) Photo editing with Apple Photo Editor and Keynote
5	Digital Literacy		Computer Science Creating more complex programs with Scratch			<u>Data and Information</u> <u>(IT)</u> Flat file data bases
6	Digital Literacy		Computer Science Advanced programming using Swift Playgrounds			Computing Systems and Networks Search engines communication



Cross Curricular Links

Computing provides a range of opportunities for cross curricular links. Each area lends itself more naturally to, but not exclusively, to different parts of National Curriculum. Digital Literacy has strong links to the English curriculum through the Spoken Language area where lessons are driven through pupil discussion as well as offering pupils the opportunity to develop their reading skills through the investigating of different forms of short texts.

Computer Science is mostly linked to the Maths curriculum through the aim of problem solving and reasoning mathematically and in some years, there are some more direct links to the National Curriculum programs of study, for example in Year 1 and Year 2 pupils explore directional language. In year 4 pupils use work with angles and use a Logo programming language to draw 2-d Shapes.

We have linked the Information Technology area closer to our humanities curriculum where it best fits to help pupils revisit ideas learnt in previous terms. In Year 5 pupils complete a unit of work on data collection so this has a link with the Maths curriculum rather than humanities.

Year group	Computing Unit	Linked curriculum Subject / area
1	Digital painting	Art –
	Digital writing	History – The Victorians
	Moving a robot	Maths – Position and direction
2	Pictograms	Maths - Statistics
		Geography – Weather
	Robot algorithms	Maths – Position and direction
3	Sequences in music with Scratch	Music – Composing
	Animation	History – The Romans
Δ	Photo editing with Apple Photo Editor and Keynote	Geography – Coventry
- -	Thoto cutting with Apple Thoto Eartor and Reynote	coography covering
	Repetition in shapes with Logo	Maths - Geometry – properties of shapes
		·····
5	Flat file data bases	Maths – Statistics
6	Search engines and communication	History – The Mayans



Digital Literacy whole school skills progression and knowledge

1	Use technology safely.
	Show kindness when using technology.
	Recognise common uses of information technology beyond school.
	Recognise examples of personal information.
	Recognise the trusted adults who can be spoken to about an online issue.
2	Consolidates and builds upon the skills and sticky knowledge from the previous year.
	New Skills and knowledge
	Use technology respectfully.
	Learn to keep 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.
3	Consolidates and builds upon using technology safely and respectfully.
	New skills and knowledge
	Using technology responsibly
4	Consolidates and builds upon using technology safely, respectfully and responsibly.
	New skills and knowledge
	Understand the opportunities computer networks offer for communication and collaboration.
	Recognise acceptable/unacceptable behaviour.
5	Consolidates and builds upon using technology safely, respectfully and responsibly.
	Understand the opportunities computer networks offer for communication and collaboration.
	Recognise acceptable/unacceptable behaviour.
	New skills and knowledge
	Identify a range of ways to report concerns about content and contact.
6	Consolidates and builds upon using technology safely, respectfully and responsibly.
-	
	Recognise acceptable/unacceptable behaviour.
	Identify a range of ways to report concerns about content and contact.
	New skills and knowledge
	Be discerning in evaluating digital content.



Computer Science whole school skills progression and knowledge

1	Understand what algorithms are. Create simple programs.		
2	Consolidates and builds upon creating simple programs.		
	New skills and knowledgeUnderstand that algorithms are implemented as programs on digital devices.Use logical reasoning to predict the behaviour of simple programs.Understand that programs execute by following precise and unambiguous instructions.Debug simple programs.		
3	Consolidates and builds upon debugging simple programs. Use logical reasoning to predict the behaviour of simple programs.		
	New skills and knowledge Write programs that accomplish specific goals. Work with forms of input and output. Use sequences in programs.		
4	Consolidates and builds upon using sequences in programs.		
	New skills and knowledge Design and create programs that accomplish specific goals. Use repetition in programs. Debug programs that accomplish specific goals. Use repetition in programs.		
5	Consolidates and builds upon design and create programs that accomplish specific goals. Use repetition and sequences in programs.		
	New skills and knowledge Solve problems by decomposing them into smaller parts. Use logical reasoning to detect and correct errors in algorithms. Use logical reasoning to explain how some simple algorithms work.		
6	Consolidates and builds upon designing and creating programs that accomplish specific goals. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms.		
	New skills and knowledge Use selection and variables in programs. Understand how computer networks can provide multiple services, such as the World Wide Web. Appreciate how search results are selected appreciate how search results are ranked.		



Information Technology school skills progression and knowledge

1	Use technology purposefully to create digital content.				
	Use technology purposefully to store digital content.				
	Use technology nurposefully to retrieve digital content				
2	Consolidates and builds upon all skills from providus year				
Z	Consolidates and builds upon all skills from previous year.				
	New skills and knowledge				
	Use technology purposefully to manipulate digital content.				
	Use technology purposefully to organise data.				
	Collect data.				
	Present data				
	Answer questions about data				
	Answer questions about data.				
2	Concelidates and builds upon using technology purposefully to scapto, organise and manipulate digital content				
5	consolidates and builds upon using technology purposeruny to create, organise and manipulate digital content.				
	New skills and knowledge				
	Design and create content.				
4	Consolidates and builds upon using technology purposefully to create, organise and manipulate digital content.				
	New skills and knowledge				
	Combine a variety of software to accomplish given goals.				
	Use search technologies effectively.				
5	Consolidates and builds upon using technology purposefully to create organise and manipulate digital content				
5	Collect data				
	Present data.				
	Answer questions about data.				
	New skills and knowledge				
	New Skills and Knowledge				
	Analyse data. Select, use and combine internet services				
	Evaluate data.				
-					
6	Pupils complete a Computer Science unit				



Implementation

At Whitmore Park we understand that a good implementation relies on a robust, effective and ambitious curriculum intent. This is ensured in a variety of ways. To begin with, computing lessons are taught discretely by a subject specialist in 1-hour lessons. In Key Stage 1, pupils have weekly Computing lessons for 6 terms. In Key Stage 2, pupils have weekly lessons for 3 terms. Computing is taught discretely to ensure pupils are clear about the key Computing knowledge and skills. Pupils use the sticky knowledge from different subjects as the context for their computing lessons. Opportunities are then planned within foundation subjects for pupils to use their Computing skills to help enrich and deepen learning throughout all subjects. As pupils already have the skills and knowledge from Computing lessons, this means any learning that involves the use of technology within foundation subjects does not come at the expense of subject knowledge and allow the subject to be taken further. By having a specialist teacher whose CPD is focused on developing the computing curriculum, we ensure that teacher subject knowledge and pedagogical knowledge is of a high standard.

Our curriculum is an ambitious one which provides engaging and exciting learning opportunities. Our computing programme aspires to be just as and even more ambitious than the National Curriculum. We do this through allowing pupils in Year 1 and Year 2 six terms worth of Computing lessons that build upon previous learning and then develop skills and knowledge further. By doing this in Key Stage 1 we ensure pupils have a fantastic foundation for when they go onto Key Stage 2. By having hour long weekly lessons for 3 terms in Key Stage 2, we ensure that pupils have a board and balanced experience of the 3 different computing areas and that all expectations of the National Curriculum are covered.

Our use of resources in computing is another area that highlights our curriculum's ambition. When studying Computer Science, we use a range of programming software and languages and in Information Technology area, the pupils use a range of different digital media software. All this software allows pupils to engage in creative project-based learning that inspires, engages and stretches. In various places within the curriculum, we make use of parts of the NCCE Teach Computing curriculum, which is based upon the latest pedogeological research and has been written by and regularly reviewed by computing subject knowledge experts. This curriculum is adapted for our school context and enhanced with other schemes of work, such as CS First with Google to ensure the curriculum is as ambitious as it can be. For the Digital Literacy area of the curriculum, we have adapted parts of the ProjectEVOLVE tool kit, which has been written by a team of experts at the UK Safer Internet Centre and based upon the 330 statements from UK Council for Internet Safety's (UKCIS) framework "Education for a Connected World" mentioned in the "Teaching online safety in school" Department of Education guidance.



At the foundation of our computing curriculum lies the aim of developing a secure conceptual understanding of key concepts and vocabulary for all pupils. One way in which pupils are exposed to knowledge is through knowledge organisers. For each unit of work pupils have a knowledge organiser that they can use to anchor their understanding. These knowledge organisers include overviews of different software as well as key vocabulary. Another way that key concepts, or new units of work, are introduced by using "unplugged activities" to help them make connections with other subjects or ground abstract concepts to something more tangible. The curriculum's skills and knowledge are organised in a sequential way. Each year the skills that pupils learn reviews, consolidates and builds upon the previous year. This ensures that things that pupils learn are being stored in their long-term memory. The curriculum makes use of different structed frameworks to keep learning tied to the best pedogeological practice. At Whitmore Park, we use a combination of the Use – Modify – Create model as well as the PRIMM model, (Predict, Run, Investigate, Modify and Make) (shown below) to structure units of work and, where appropriate, individual lessons.



These models both encourage pupils to engage in reading code before they write code. Research shows that this method can enhance and secure their ability to write better code later. To help support pupils we often make use of Parson's problems, this is where pupils are given the code needed to solve problems, but it is jumbled up or needs putting together in the right order. This is sometimes used to provide support for pupils who have SEN but is also a great resource for all pupils as it again encourages pupils to engage with and read code as well as providing a scaffold.

Our curriculum provides project-based learning. Pupils learn best when they are engaged in making creative products. We use a blended approach of open-ended projects, projects that require pupils to meet a brief as well as and more individual skills-based lessons. An important aspect of teaching in our curriculum is through the modelling of everything first. Through writing programs or creating digital media live, talking out loud the thought processes and making mistakes we are modelling that it is normal for things to go wrong and encourages greater resilience in our pupils. It also provides another method of scaffolding for pupils to use to. By using these different approaches, we provide pupils with scaffolded activities that support pupils and provide opportunities for pupils to be creative and problem solve independently.



Another important area in our curriculum is collaboration. Collaboration is a highly valued skill in the tech world. One way that collaboration is encouraged is through the appropriate use of paired programming. This is where 2 programmers work together at 1 station. 1 is the "Driver" who writes the code. The other is the "Navigator", they watch to make sure the code is correct and make corrections when necessary. Pupil's switch roles frequently. Pupils are carefully paired, and it is not just used to support any lower attaining pupils. It is also a useful tool for sharing out cognitive load. This method is not exclusive to Computer Science but can be used in other areas as well.

Assessment is seen as a powerful tool which is used to check if pupils understand concepts, are competent in the skills they are taught and can explain their ideas. A range of formative assessment is used to help students identify their strengths and weakness and help the teacher to highlight and target areas they need to work on. Teachers can then adapt their future teaching so pupils can move on in the most effective way. By making use of formative assessment the teacher can also recognise any misconceptions that pupils might have and address in the best way. Teachers use both formative and summative assessment to assess if the key concepts of computing are embedded in pupil's long-term memory. By making good use of assessment, we can make sure we can plan lessons and learning activities that allow individual pupils to move forward in the best way, providing corrections to misconceptions or more challenge where necessary.

The curriculum is enriched in a variety of ways. The school offers a termly Coding Club where pupils can explore and study programming in a small group environment that is teacher led, meaning they have more space to explore and learn. We also run a Digital Leaders scheme where pupils become experts in the software that teachers and pupils use in class. These pupils are also given additional responsibilities that ensure the technology we use is school is well looked after and can be used effectively.



Impact

The impact of our curriculum's Intent on pupils is that they will become confident, knowledgeable, and reflective learners who can work independently and collaboratively. The curriculum imparts onto pupils the required knowledge and skills to be successful on not only their educational journey throughout primary school but also sets them up with the best possible foundations for when they move onto secondary school. This in turn will afford them all the opportunities to succeed when they join the digital jobs market of the future.

One way this is ensured is through assessment. Specialist teachers make use of formative assessment to check in on pupil learning and adjust future planning as and when is necessary. A range of different questioning types, based upon Rosenshines principles and Sherrington's questions, are during lessons to provide immediate feedback to and from pupils to best shape what happens next, with the teacher correcting misconceptions as they arise and moving pupils onto the next step when they are ready. Pupils engage in self and peer assessment in a variety of forms to capture pupil understand and provide opportunities for pupils give explain their ideas and reflect upon their learning. Feedback is another important method of formative assessment. Pupils are given opportunities to feedback their progress to class teachers during lessons, this in combination with mini plenaries and end of lesson plenaries, enables the teacher to deal with misconceptions that pupils might have as well as highlight work that has met the success criteria. Again, giving pupils the chance to reflect and evaluate their own work. A digital record, that is marked and commented, of pupil learning is kept on one learning platform that pupils can access as the beginning of a lesson to help revise previous learning and make progress. These are just some of the examples of how formative assessment is used to inform planning and make sure the teacher is aware of what pupils know during and after lessons.

Accuracy for summative assessment in computing is provided using an assessment framework. This framework is built into the skills and knowledge that pupils learn each year. The framework is used to assess pupils, keep track of their progress and make regular reports to parents. Our assessment framework is adapted from the Computing at School Assessment Working Group's frame work developed by Miles Berry. It is a system for assessing attainment in computing aligned with the expectations from the National Curriculum. The framework has a clear liner skills and knowledge progression from Key Stage 1 to Key Stage 2, with clear assessment criteria for each year group. This allows for teachers to be clear on what skills and knowledge the pupil have been exposed to from previous years, what they need to know at the end of the year and what they will be learning in the future. Assessment rubrics are also used by the specialist teacher to score pupils against the main outcomes of the units and allows them to group pupils at working towards, working or Greater depth in age related expectations. All this assessment data is then used to inform teacher planning for the future and ensures that the teacher has a deeper knowledge of what pupils can and can't do. This data is tracked using the DC Pro website to ensure that it is up to date and easy to access.



Supporting pupils with SEND

At Whitmore Park Primary School, we believe that students with SEND should have access to the same broad and balanced curriculum as the rest of the class. All children, regardless of ability, will have the opportunity to learn Computing.

Pupils with SEND will be supported through:

- differentiation (this includes scaffolded support such as Parson's problems, knowledge organisers, word banks and flashcards)
- use of visual aids
- Use of unplugged activities to ensure new abstract concepts are introduced in a tangible way
- technology (including voice dictation tools, spell checking and predictive text, screen recording or audio recordings) to access learning where literacy skill may be a barrier to learning.
- Regular low stakes quizzing to help learners store technical language and knowledge into their long-term memory
- active learning strategies
- regular interleaving of vocabulary to reduce cognitive load
- additional adult support in class
- The use of and acting upon of formative assessment to ensure all pupils make progress