



Subject: Computing

RATIONALE FOR OUR COMPUTING CURRICULUM AT WHITE MEADOWS:

For White Meadows pupils, Computing should inspire a curiosity for technology. Our curriculum encourages children to develop knowledge of programming, become familiar with the role that IT has in their daily lives and how to stay safe online. Computational thinking is a key aspect of learning when teaching computer science as it allows children to solve problems, design systems, and understand the power and limits of human and machine intelligence.

As a school we have the following aims for the learning of computing for all children:

- children be able to understand how to conceptualise, understand and use computer-based technology.
- to be equipped with computing skills, which prepare our children for today's world and the future.
- to make certain that every child is fully aware of the risks that the internet can pose to their lives and to ensure that they know how to protect themselves and others.

By delivering an informative and creative computing curriculum, the children at White Meadows School will be better equipped to become digitally literate and active participants in a digital world. Our scheme of work is fore fronted by every child beginning each academic year with lessons teaching children about, and reminding them of, the key principles of Digital Literacy (online safety). Using the skills taught to them during computing lessons, the children are able to further enhance their learning in other curriculum areas. SEND, DS and EAL children also use these skills to access intervention programs.

The teachers at WMPA use the scheme of work provided to develop what the children know and what they remember are built on sequentially. It also equips children with the skills needed to thrive in the ever-developing technological world in which we live today. A discrete approach to the teaching of computer science and digital literacy is used to enable the children to have a concrete grasp of new concepts taught. Each year group has a set of key computing vocabulary. This progression consolidates the previous years understanding, whilst adding new words to the pupils' vocabulary. We have planned for our curriculum to be taught in a sequential way ensuring that digital literacy is taught and recapped in the Autumn term and then touched upon again in the Summer preparing the children for the long break away from school where it will be likely the children will be using their own technology more often at home. Our overview concentrates on key skills before moving on to other units of work where they will need to use their maturity to unpick computer programming. SEND pupils are able to access our curriculum through a variety of different programs and tools as well as differentiation and adaptability when it comes to delivering the curriculum e.g. speech to text, dictation, screen editors. This in turn can provide opportunities for the children to be in control of their learning and develop their independence.

As a school, we use the 'Teach Computing' Scheme and resources to ensure the children leave Year 6 equipped with the skills and knowledge they will need to access the KS3 Computing curriculum.

<u>Year Group</u>	<u>Knowledge</u>	<u>Skills</u> *See non-negotiable 'sticky knowledge' focus in green	<u>Vocabulary</u>	<u>Club/Visit/Exper</u> †
Early Years	No explicit content from EYFS Curriculum Exposure to devices in do time and in small world areas of the classroom. Discussion with children about technology both past, present and future.			
Year 1	<u>Digital literacy</u> <ul style="list-style-type: none"> • understand how to stay well behaved and safe online • recognise technology both in school and at home • to know how to be polite and kind online and why it is important • to understand what to do if someone is unkind to you online <u>Computer science</u>	<u>Digital literacy</u> <ul style="list-style-type: none"> • Explain why I need to keep my password and personal information private. • Describe the things that happen online that I must tell an adult about. • Talk about why it is important to be kind and respectful online and in real life. <u>Computer science</u>	<ul style="list-style-type: none"> • online safety • password • safe • technology • polite • kind • computer • keyboard • screen 	Numbots Club - exposure of devices

	<ul style="list-style-type: none"> • To explain what a given command will do • understand the functions of a robot • understand what a set of instructions is (algorithm) • understand how to debug a program • understand the four level that can describe a project (task - what is needed, design - what it should do, code - how it is done, running the code - what it does) <p>IT</p> <ul style="list-style-type: none"> • explain technology as something that helps us • identify parts of a computer • understand how to use a keyboard • know how to manipulate a computer program to create a picture <ul style="list-style-type: none"> • understand that objects have many different labels and can be grouped together 	<ul style="list-style-type: none"> • predict the outcome of a command on a device and match a command to an outcome • run a command on a device • follow a instruction and give directions • start a sequence using forward and backward commands • experiment with turn and move on a robot • to plan a simple program • debug a program • use the functions in Scratch Jr and create a simple program using algorithms • test the effectiveness of the program <p>IT</p> <ul style="list-style-type: none"> • switch on a computer and log into a computer • use a mouse to click and drag • type on a keyboard and edit • make marks on the screen and use the shape tool • create a picture on a computer • label and group objects • compare objects and record and share what has been found out 	<ul style="list-style-type: none"> • mouse • drag • tools • label • group • record • save • delete • beebot • robot • command • program • instruction/algorithm • login • debug • sprite • blocks 	
Year 2	<p>Digital literacy</p> <ul style="list-style-type: none"> • to know that you can always speak to a grown up who will be able to help • understand that if there is anything you see or hear online that makes you feel worried, scared or sad you can put your device and talk to a adult • understand what consent is • understand what personal information is <p>IT</p> <ul style="list-style-type: none"> • recognise the uses and features of IT • know how to use IT effectively • know what devices can be used to take photographs • understand the process of taking a good photograph • know what pitch and duration is <p>Computer science</p> <ul style="list-style-type: none"> • understand what a set of instruction are • know how to create clear, unambiguous instructions • know how to program a floor robot • understand the four level that can describe a project (task - what is needed, design - what it should do, code - how it is done, running the code - what it does) • understand the different outcome of blocks used on a computer program • know what debugging is and how to do it effectively 	<p>Digital literacy</p> <ul style="list-style-type: none"> • Identify what personal information is. • Be able to communicate with adults if you see or hear anything worrying online. • Follow sensible online safety rules. • explain what consent is <p>IT</p> <ul style="list-style-type: none"> • describe the uses of a computer and identify that it is part of technology • make good choices when using IT • list different uses of IT both in and out of school. • use IT responsibly • capture digital photos • edit photographs using list and desired tools • choose an effective tools to adapt a photograph • identify images that have been changed • record data in a tally • enter data on a computer • use a computer program to present information in different ways • create a pictogram • use objects to make comparisons • create a rhythm pattern • use a computer to experiment with pitch and duration • create a musical pattern using a computer program • save work in a file • retrieve work that has been previously saved. <p>Computer science</p> <ul style="list-style-type: none"> • follow instructions as a sequence • give clear, unambiguous instructions • create different algorithms • predict an outcome • compare prediction to the program outcome • create an algorithm to meet a goal • test and debug an algorithm • identify the start of a program 	<ul style="list-style-type: none"> • videos • consent • personal information • computers • technology • file • resize • device • photograph • capture • resize • edit • lighting • tally chart • data • pictogram • object • information • instructions/algorithms • sequence • unambiguous • goal • test • debug • music • pitch • duration • rhythm pattern • program • block • project <p>compare</p>	

		<ul style="list-style-type: none"> • change the design on a program • create an simple algorithm on a computer program • work out the action of a sprite in an algorithm • edit and improve code on a computer program 		
Year 3	<p>Digital Literacy</p> <ul style="list-style-type: none"> • use technology safely, respectfully and responsibly; know a range of ways to report concerns and inappropriate behaviour <p>IT</p> <ul style="list-style-type: none"> • understand how digital devices function • know the input, process and output of a device. • recognise digital devices can change the way we work • know the differences between digital devices and non-digital tools • understand what a computer network is • know what the role of a switch,server and wireless access point in a network • know what an animation is • understand what stop motion is and how it is made • know the difference between text and images • define the term page orientation • know why desktop publishing might be helpful • explain what a branching database is • know how branching database collect data <p>Computer science</p> <ul style="list-style-type: none"> • understand what programming is • know what a sequence is • understand what a block of code is and what it does • know the relationship between an event and action • know how to modify a program • explain what bugs in programming means <p>know the suitable features that can be adapted in a programming environment</p>	<p>Digital Literacy</p> <ul style="list-style-type: none"> • I can talk about what makes a secure password and why they are important. • I can create a secure password. • I can protect my personal information when I do different things online. • I can use the safety features of websites as well as reporting concerns to an adult. • I can recognise websites and games appropriate for my age. • I can make good choices about what I do online. • I can show respect to others online. • I can tell you ways to communicate with others online. <p>IT</p> <ul style="list-style-type: none"> • explain that digital devices accept inputs and outputs • follow a process • classify input and output devices • model a simple process • design a digital device • identify how devices in a network are connected with one another • identify benefits of a computer network • draw a sequence of pictures • create an effective flipbook • predict what a animation will look like • create an effective stop frame animation • add media to a animation • evaluate the animation created • change font style, colour and size for given purpose • create a template for a specific purpose • copy and paste text and images • Identify the object attributes needed to collect relevant data • Create a branching database • Create yes/no questions using given attributes • compare two branching databases <p>Computer science</p> <ul style="list-style-type: none"> • identify sprites and backdrops • create a program and follow a design • create a sequence of connected commands • change the appearance of my project • explain choices that you have made in your program • create a program to move a sprite in four directions • adapt a program I have created • choose blocks to set up a program • test program against given design • modify a program using design • evaluate my project 	<ul style="list-style-type: none"> • Smart • Alert • Secure • Kind • Brave • Safe • Report • bystander • online • download • input • output • process • network • server • switch • wireless access point • animation • sequence • flip book animation • predict • characters • setting • media • film • Scratch • sprites • backdrop • attributes • actions • design • algorithm = code • text • image • purpose • copy and paste • desktop publishing • branching database • groups • questions • error • debug • create • predict • logical reasoning • repeats • evaluate 	

<p>Year 4</p>	<p>Digital Literacy</p> <ul style="list-style-type: none"> • use technology safely, respectfully and responsibly; know a range of ways to report concerns and inappropriate behaviour • use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content <p>IT</p> <ul style="list-style-type: none"> • Describe the internet as a network of networks • know how networks physically connect to other networks • recognise how networked devices make up the internet • understand how the internet allows us to view the World Wide Web • describe how to access websites on the WWW • recognise how the content of the WWW is created by people • Understand what data is and how it can be collected • Understand that digital images can be changed • Recognise that not all images are real <p>Computer science</p> <ul style="list-style-type: none"> • Understand what an sequenced algorithms is • Know what repeat means • Recognise repetition in a piece of code • Understand how to evaluate a piece of code 	<p>Digital Literacy</p> <ul style="list-style-type: none"> • I can talk about the importance of keeping personal information private. • I know that others may not be who they say they are online and question suspicious behaviour with a trusted adult. • I can talk about the ways I can protect myself and my friends from harm online. • I use the safety features of websites as well as reporting concerns to an adult. • I know that anything I post online can be seen by others. • I understand that everyone has a responsibility to create a positive atmosphere online. • I choose websites and games that are appropriate for my age. • I can talk about why I need to ask a trusted adult before downloading files and games from the Internet. • I comment positively and respectfully online. <p>IT</p> <ul style="list-style-type: none"> • Create media which can be found on the websites • Evaluate the consequence of unreliable content • Identify that sound can be digitally recorded • Use a device to record sound • Plan and write the content for a podcast • Save digital recordings • Open and edit digital recordings • Choose data set to answer questions • Use a digital device to collect data automatically • Use data collected over a long duration of time • Use collected data to answer questions • Change the composition of an image • Make good choices when selecting different tools • Evaluate how changes improve an image • <p>Computer science</p> <ul style="list-style-type: none"> • Program a computer by typing commands • Create a code snippet for a given purpose • Use a count controlled loop to produce a given outcome • Develop a program by debugging it • Develop the use of count-controlled loops in a different programming environment • Predict an outcome of a snippet of code • Design a project that includes repetition • Refine the algorithm 	<ul style="list-style-type: none"> • networks • information • internet • World Wide Web • Media • Websites • Audio • Digital devices • inputs • outputs • record • commands • code • algorithm • repeat • repetition • patterns • count-controlled loop • loop • procedure • debugging • data • composition • environment 	
<p>Year 5</p>	<p>Digital Literacy</p> <ul style="list-style-type: none"> • use technology safely, respectfully and responsibly; know a range of ways to report concerns and inappropriate behaviour • use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content <p>IT</p> <ul style="list-style-type: none"> • Describe that a computer system features input, processes and outputs • Explain that computer systems communicate with other devices 	<p>Digital Literacy</p> <ul style="list-style-type: none"> • I protect my password and other personal information. • I can explain why I need to protect myself and my friends and the best ways to do this, including reporting concerns to an adult. • I know that anything I post online can be seen, used and may affect others. • I can talk about the dangers of spending too long online or playing a game. • I can explain the importance of communicating kindly and respectfully. • I can discuss the importance of choosing an age-appropriate website or game. • I can explain why I need to protect my computer or device from harm. • I can become a critical consumer when online. <p>IT</p> <ul style="list-style-type: none"> • Plan a video project using a storyboard 	<ul style="list-style-type: none"> • systems • processes • inputs • outputs • networks • information • project • lighting • shooting • clipping • special effects • simple circuit • microcontroller 	

	<ul style="list-style-type: none"> Recognise the role of computer systems in our lives Recognise how information is transferred over the internet Recognise the features of an effective video Understand the difference between paper and computer based databases Apply knowledge of a database to ask and answer real world questions Understand that drawing tools can be produce different outcomes Recognise that vector drawings consist of layers <p>Computer science</p> <ul style="list-style-type: none"> Know what a simple circuit is Develop an understanding of how the flow of actions in algorithms and programs can be controlled by conditions Explain how selection is used in computer programs 	<ul style="list-style-type: none"> Identify digital devices that can record video Capture video using a digital device Identify that video can be improved through reshooting and editing Consider the impact of the choices made when making and sharing a video Use a form to record information Compare paper and computer based databases Group information to answer questions Explain that tools can be used to select specific data Create a vector drawing by combining shapes Use tools to achieve desired effects Group objects to make them easier to work with Evaluate vector drawings <p>Computer science</p> <ul style="list-style-type: none"> Control a simple circuit connected to a computer Write a program that includes count-controlled loops Explain that a loop can stop when a condition is met Design a physical project that includes selection Create a controllable system that includes selection Test and debug the system that has been created Create a program which uses selection Evaluate my program 	<ul style="list-style-type: none"> infinite loop condition flat file database filter vector zoom layers conditions outcomes crumble 	
Year 6	<p>Digital Literacy</p> <ul style="list-style-type: none"> use technology safely, respectfully and responsibly; know a range of ways to report concerns and inappropriate behaviour use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content <p>IT</p> <ul style="list-style-type: none"> Know what a search engine is Know how search engines are ranked Recognise why the order of results is important and to whom Recognise how we communicate using technology Explain that objects can be described understand what copyright is Recognise the need to preview pages <p>Computer science</p> <ul style="list-style-type: none"> Understand a variable as something that is changeable Know what selection can control the flow of a program Explain what a conditional statement is 	<p>Digital Literacy</p> <ul style="list-style-type: none"> I protect my password and other personal information. I can explain the consequences of sharing too much about myself online. I support my friends to protect themselves and make good choices online, including reporting concerns to an adult. I can explain the consequences of spending too much time online or on a game. I can explain the consequences to myself and others of not communicating kindly and respectfully. I protect my computer or device from harm on the Internet. I can select an appropriate tool to communicate and collaborate online. <p>IT</p> <ul style="list-style-type: none"> Search the web using specific information Refine my search and compare Use a computer to create and manipulate three dimensional digital objects Compare working digitally with 2D and 3D graphics Construct a digital 3D model of a physical object Develop and improve a digital 3D model Identify questions which can be answered using data Create a spreadsheet to plan an event Choose suitable ways to present data Plan the features of a web page Outline the need for a navigation page <p>Computer science</p> <ul style="list-style-type: none"> Identify that variable can hold numbers or letters Choose how to improve a game my using variables Design a project that builds on a given example Use my design to create a project Evaluate my project 	<ul style="list-style-type: none"> search engine web crawlers search ranked manipulate 3D model 2D model variable placeholder spreadsheets objects formulas cells graph questions website media copyright navigation path controllable device sensing modify input output 	

		<ul style="list-style-type: none"> • Create a program to run on a controllable device • Use an conditional statement to compare a variable to a value • Design a project that uses inputs and outputs on a controllable device • Develop a program to use inputs and outputs on a controllable device 		
KS3	<ul style="list-style-type: none"> ▪ 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. ▪ 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 ▪ 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. 	<ul style="list-style-type: none"> • design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems. • 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 • 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 	<ul style="list-style-type: none"> • Computational thinking • Boolean • Script • Binary • abstraction • graphics • control blocks • copyright • compression • byte • encryptions • embedded systems • python • data types • behaviours • path • cache • protocols • privacy • tables • lists • procedures • physical systems • conversion • text • sound • picture 	