

# PROGRESSION OF SKILLS AND KNOWLEDGE



## COMPUTING

Key: **Computer Science**      **Information Technology**      **Digital Literacy**

This is to ensure that there is a spread of all three parts of the curriculum across each year group.

Year	Knowledge		Skills		Learning Outcomes		Vocabulary
<b>EYFS</b>	What is the Internet? Teach chn about the simple facts about what the Internet is and understand how to use it safely What is e-safety? E-safety Understand how to use the Internet safely How do we use features on a computer or a tablet safely and make sure that it is appropriate for my age		Chn understand how to identify simple problems that we may encounter when using computers or the Internet Chn understand what we use computers and other technologies for on a daily basis Chn understand what we use technology for How do computers help those who help us? For example, the ambulance uses GPS/their phones to find out where people they are helping live Chn begin to understand how to use devices safely, down to how we handle technology safely and respectfully		Chn to understand basics of Internet navigation Chn to understand fundamentals of e-safety for later years Chn to understand how to use hardware safely		Internet Safety Computer Tablet Connected
	Me and My Family	Past and Present	The World around us	Imaginary World	Journeys	Animal Adventures	
<b>Year 1</b>	What is a program? How can we write a simple program? How do I fix a program? What programs, apps and other tools on a computer or tablet can I use to help me with my learning? How can I safely use a computer, electronic device and the Internet safely?		Chn understand what a program is and how we can write and fix programs when they go wrong. Chn use a variety of different programs to solve problems that are set and aid me in my learning Chn begin to use Internet search engines safely and effectively Chn begin to understand how we communicate safely and respectfully on the Internet (constant referral to the SMART guidelines for Internet safety)		Chn to understand fundamentals of programs Chn to understand what programs to use for certain purposes Chn begin to use search engines safely Chn to understand the basics of SMART e-safety guidance		Program Debugging (fixing) Search Engine Internet Safety Communication
	What makes us special?	Who would buy a castle?	Who lives on Old MacDonald's farm?	Is nature creative?	<b>What makes Africa great??</b>	How do you care for an ocean?	
	<b>Online safety (4 weeks)</b> Grouping and sorting (2 weeks) – maths/science links	<b>Pictograms (3 weeks) – maths link</b> <b>Lego Builders (3 weeks) – English instruction writing</b>	Maze Explorers (4 weeks) – maths link	<b>Animated story books (5 weeks)</b> English story writing/art/topic	<b>Coding (6 weeks) Topic</b>	<b>Spreadsheets (3 weeks)</b> <b>Technology</b> outside school (2 weeks)	
<b>Year 2</b>	What is an algorithm and how can I create and use one? By the end of the year chn should be able to understand that an algorithm is a set of instructions that a computer follows in order to complete a task. Chn can convert these algorithms into simple code How can I organise data into a database? Chn are introduced to the concept of a database and how we can use these to organise data and search through data		To understand how to code an algorithm To understand how to debug a simple program To input, organise and comment on simple data and databases To increase coding skills in order to create animations and interactive programs (e.g. simple games) using a variety of different programs		Chn to be able to explain and show what an algorithm is Chn to understand how to make a simple algorithm Chn to understand how to debug a program Chn to understand basics of databases and be able to make a simple one		Algorithm Instructions Data Database Data collection Coding Interactive Debugging (fixing)

	Understand how we can use a variety of programs to animate and create interactive code programs						
	Is Watford the best place to live?  <b>Migration opportunity</b>	Can you burn a city down?	Has exploration improved the world?	Is nature an inspiration?	<b>What makes Africa great??</b>	How do you care for an ocean?	
	<b>Coding (6 weeks) – geography/history</b>	<b>Online safety (2 weeks)</b> <b>Spreadsheets (4 weeks) – maths money</b>	<b>Questioning (5 weeks) maths</b>	<b>Creating pictures (5 weeks) Art</b>	<b>Making music (3 weeks)</b> <b>Effective Searching (3 weeks) topics</b>	<b>Presenting ideas (4 weeks) English/topics</b>	
<b>Year 3</b>	Use coding to solve real world problems Deconstruct a real-life situation and create an algorithm to translate this into code Chn develop their knowledge of how to break down their programs into steps that others can understand Chn begin to use “if” statements in their programs to advance the complexity of their programs		To begin to use timer commands in their coding To advance their knowledge of how to use different debugging techniques to improve their programs Chn can advance their skills of carrying out safe Internet searches and understand how to use the PurpleMash search engine or Google Safe Search Begin to use apps such as 2Question and 2Graph to consider how they can effectively collect and analyse different data sets Chn continue to advance their safe Internet skills and can understand how to increase the complexity of their passwords and explain why a strong, secure password is a huge part of safety on the Internet		Chn able to produce programs that use timers Chn can produce at least two programs independently that use “if” statements Chn able to link the programs they are coding to real-world uses Chn able to use advanced debugging skills to improve programs Chn able to use search engines more effectively and efficiently Chn able to use apps and programs to collect and represent data in tables and graphs Chn able to pick their own strong and secure passwords or memorable words and remember them		Timers (coding term) Safe Search Survey Graphing Data collection Data representation Complex (passwords) Memorable words If statements (coding term)
	Has Watford aged well?	Was Stone Age life really that ‘hard’?	Did Britannia really rule the waves?	How civilised were the Egyptians?	Could you live near a volcano?	Can bees save the world?	
	<b>Coding (6 weeks)</b>	<b>Online safety (3 weeks)</b> <b>Spreadsheets (3 weeks) – maths comparing numbers</b>	<b>*Touch typing (4 weeks)</b> <b>Graphing (2 weeks) – maths/Science</b>	<b>Email (6 weeks) – English/History</b>	<b>Branching databases (4 weeks)</b> <b>geography/Science Simulations (3 weeks)</b>	<b>Presenting (6 weeks)</b>	
<b>Year 4</b>	Chn continue to advance knowledge of programming, introducing a more complex structure of variables into their programs. Chn are able to manipulate the values of their variables in order to change the behaviour of their programs Chn are made aware of the different components that allow for a computer or another device to connect to the Internet or a local network Chn are introduced to the basics of the structure of a webpage and how to discern the credibility of a webpage from looking at it		Chn are able to look at their programs with variables critically and understand how they can improve upon their existing code in order to address problems of increasing complexity Chn are able to look at a computer and understand where the key network components are located or may well be located (if they are internally-based) Using apps such as 2Connect and 2Publish+, chn are able to create digital documents, mind-maps for lessons across the curriculum Chn to use 2Connect to mind map and organise their ideas in a cohesive fashion. Introduce more complex Internet safety issues, such as how the Internet can often lead to negative effects on self-esteem		Chn able to evaluate programs critically and debug independently Chn able to look at networks and understand how computers around the world connect to each other Chn able to identify key network hardware pieces around school and at home Chn able to confidently publish pieces of writing using publishing apps such as 2Publish. Two examples in Year 4 Chn can begin to construct mindmaps in 2Connect across the curriculum. Two per year, each in a non-Computing subject		Evaluate Test Debug Revision (linked to debugging process) Network LAN (advanced vocab) WLAN (advanced vocab) Router Connectivity Wi-Fi Publishing Word processor

	Do all roads lead to St Albans?	Were the Romans really that great?	Can you save a snowman's life?	How does an unsinkable ship sink?	What thrives in a city?	What would David Attenborough do?	
	Coding (6 weeks)	Online safety (4 weeks) Effective Searching (3 wks - History)	Spreadsheets (6 weeks) Science/Maths	Writing for different audiences – English, History	Logo (4 weeks) Art Animation (3 weeks)	Hardware investigators (2 wks) Making music (4 wks)	
<b>Year 5</b>	<p>Chn can translate algorithms into structures that make their codes easier to understand. Using repetition, they make their code easy to design and replicate</p> <p>Chn when coding think about how easy to code is going to be to edit and debug (fix) when they return to the code. This leads to them knowing about which labels to assign to which variable</p> <p>Chn have knowledge of how to safeguard their privacy and data on networks both in school and out</p> <p>Chn have a greater knowledge of advanced search terms to aid their searching of the Internet</p> <p>Chn advance their knowledge of Internet safety and begin to think critically about using the Internet for social purposes i.e. social media and online gaming</p> <p>Chn to gain increased knowledge of which programs and apps to use for which circumstances e.g. is this problem more effectively solved by using Microsoft Word or something else?</p>		<p>Chn can effectively label code for ease of editing later</p> <p>Chn can use knowledge of structures to make their algorithms easier to understand and interpret</p> <p>Chn are able to create passwords and safeguards that keep their data secure on both school and home networks. Chn begin to understand which data is appropriate to be stored and when to store the data vs. when to not</p> <p>Chn are able to use their enhanced understanding of search terms to search the Internet effectively and safely</p> <p>Using feedback on their computer-based solutions to problems, chn are able to hone their programs and understand how to action feedback based on suggested improvement</p> <p>Chn are also able to judge constructively the works of others and suggest alternative solutions to problems and present their own solutions to said problems</p> <p>Chn are able to use their digital literacy skills from previous years and begin to apply said skills to think about topics such as safety on social media and online gaming (link closely to work on mental wellbeing in PSHE)</p>		<p>Chn can use codes that are easy to understand and explain to other adults and chn</p> <p>Chn able to create at least one program that uses repetition in its code</p> <p>Chn able to debug programs with near independence</p> <p>Chn have a strong awareness of protecting their online identity (with an understanding of social media safety beginning to come through)</p> <p>Chn can express the positive and negatives that excessive Internet usage (for gaming, socialising etc.) has on wellbeing</p> <p>Chn can select independently apps that they would use to solve a problem or complete a task (cross-curricular)</p>		<p>Translate (computing)</p> <p>Algorithm</p> <p>Safeguard (e-safety link)</p> <p>Privacy</p> <p>Online identity</p> <p>Digital wellbeing</p> <p>Real-world problems</p> <p>Digital Solutions</p> <p>Security</p>
	Could you have descended from Tudor royalty?	Who invited the Vikings?	We're the centre of the Universe aren't we?	Can you sculpt your story?	Where on Earth could you find a home, a cure and an adventure?	Are rain forests worth saving?	
	Coding (6 weeks)	Online safety Databases (4 weeks) – geography/history	Spreadsheets (6 weeks) – maths measurements	Game creator (5 weeks)	3 D modelling (4 weeks) Concept maps (4 weeks)	Word processing – English/writing in other subjects	
<b>Year 6</b>	<p>Chn to gain more advanced knowledge of programming in order to address problems of increasing complexity</p> <p>Chn are able to identify the most important parts of the problem to address (make an abstraction) and then decompose this into a logical way to address the problems</p> <p>Chn are able to understand the knowledge that they need to test and debug the programs that they make and understand what it means to take a systematic approach to identifying issues in the programs that they make</p> <p>Chn are able to look at the parts or whole of program that either they make or someone else has and use their knowledge to improve or change parts of the program or the whole program</p> <p>Chn gain an understanding about the similarities and differences between WLAN and LAN and are able to describe how this links to their Internet access in school</p> <p>Chn begin to have an understanding of what kind of sites are reputable and introduced to the concept of "fake news" and unreliable sources of information e.g. social media</p>		<p>With their enhanced understanding of programming, a Y6 ch will be able to debug and test their programs with great effectiveness and even transfer this skill to programs that are not their own (such as a classmate's)</p> <p>Chn can map out WLAN and LAN networks using tools such as 2Connect or simply by drawing a diagram on paper</p> <p>Building on Y5, chn can advance the structures that they use in their coding to make their code easier to understand for others. This increased structure will also allow for the efficiency of their debugging process to increase their overall skill in the debug – test phase of their programming</p> <p>Chn can begin to discern between reliable and unreliable sources of information. Apply the "rule of three" to finding out information on the Internet (can I find this story or piece of information in at least 3 different reliable and reputable sources)</p> <p>Chn to advance their online safety skills by using the approach of the "rule of three", SMART guidelines and also by using greater critical thinking skills, reflect on the permanency of information that you put out into the online world</p>		<p>Chn able to produce programs that reflect understanding of addressing issues in order of complexity</p> <p>Chn able to break real-world problems down into manageable parts to aid in a planning of a program (beginnings of the abstraction process)</p> <p>Chn able to work collaboratively on programs and identify ways to improve their programs through feedback and reflection</p> <p>Chn are able to show that they debug in a systematic and organised way independently in response to the feedback given</p> <p>Chn can discuss and map out with confidence a network of computers</p> <p>Chn can begin to suggest ways in which networks could be improved</p> <p>Chn are able to express with confidence what a "reputable" site is and how</p>		<p>Abstraction</p> <p>Prioritisation</p> <p>Feedback</p> <p>Collaboration</p> <p>Reputable</p> <p>"Fake News"</p> <p>Criticality</p> <p>Scams</p> <p>Phishing</p> <p>Identity theft</p> <p>Social Media</p> <p>Influencers (PSHE links)</p>

		Chn to use their reflection skills to link the CTS value of respect to the online world and think about how they can be respectful and helpful online citizens	scams, fake news and questionable sources can be identified on the Internet Chn can reflect on the importance of using the Internet (with strong link to social media) respectfully as citizens of the world			
	How do you travel on lands without roads?	Can one woman save the world?	Can a light save a life?	Is war the best way to get what you want?	What fills your bucket?	Who will save the planet?
	Coding (6 weeks)	Online safety (2 weeks) Blogging (4 weeks) English/History	Spreadsheets (5 weeks) Maths probability, money problems	Text adventures (5 weeks) Networks (3 weeks)	Quizzing (6 weeks)	Understanding binary (4 weeks)