Viewley Hill Academy

Awakening Curiosity
Creating Success

COMPUTING & INTERNET SAFETY CURRICULUM

Viewley Hill Academy

Computing Curriculum Intent:

The aim of the computing curriculum at Viewley Hill Academy is to give the children the skills and knowledge they need to become digital citizens. This enables them to play an active role beyond school in an ever-changing digital landscape. It is a cohesive curriculum that teaches children a range of skills and knowledge around the three strands of computing, as set out in the National Curriculum:

- Computer Science
- Digital Literacy
- Information Technology

Computer science allows children to understand computer programs and how they work. This begins with simple instructions being followed at the start of their learning journey; simple commands for a robot to follow; block programming and finally physical programming for a specific purpose by the end of Year 6. As **information technology** is crucial to being successful in society, children will create media and information with growing confidence. They will also use a range of programs to create media for different purposes, understanding what makes it effective and why it might be used. Finally, **digital literacy** gives all children the platform to understand how to be safe using technology online and offline and how to communicate effectively with each other through email (at KS2).

The curriculum has been designed in such a way that supports our mixed year group provision. The curriculum runs as cycle A and cycle B so all children are given the opportunity to access all of the skills and knowledge required by the end of each phase of school. This is carefully sequenced so that the children

Our curriculum is based on the National Centre for Computing Education's resource: **Teach Computing**.

Internet safety resources are available at **childnet.com**

Acknowledgements are made to Raspberry Pi Foundation and STEM Learning for the National Centre for Computing Education, under r the Open Government License (OGL v3) Crown Copyright & Open Government Licence (OGL)

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Foundations for Computing: Early Years

Computer Science	Information Technology	Digital Literacy
➢ Understand language of sequencing: First, then, before, after ➢ Use a sequence (eg push buttons) to make a toy work ➢ Explore the Beebot robot with an adult and find out how it is made to move ➢ Use simple commands on the touch screen in the classroom to access content	➢ Access simple letter formation software to practise forming letter shapes	➢ Talk about how to keep safe on the computer (not to talk to strangers) ➢ Know that the internet lets us access games and films outside of school and home ➢ Know that you must tell a grown-up if something upsets or scares you.

We recognise that there is no 'computing' strand in Early Years. However, these familiar and simple ways in which the youngest children at the academy access the digital world lay a basic foundation for the next stage of their learning in Key Stage 1.

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Computing Concepts Map

	Networks	Computing Systems	Programming	Design & Development	Effective use of Tools	Creating Media	Data & Information	Algorithms
KS1								
Year 1								
Technology around us		✓						✓
Digital painting					✓	✓		
Moving a robot			✓					✓
Grouping Data							✓	✓
Digital Writing					✓	✓		
Programming animations			✓	✓				
Year 2								
Information technology around us	✓	✓						
Digital photography					✓	✓		
Robot algorithms			✓					✓
Pictograms					✓		✓	
Digital music				✓		✓		
Programming quizzes	✓			✓				
LKS2								
Year 3								
Connecting computers	✓	✓						
Stop-frame animation					✓	✓		
Sequencing sounds			✓	✓				
Branching databases					✓		✓	
Desktop publishing					✓	✓		
Events & actions in programmes			✓	✓				

	Networks	Computing Systems	Programming	Design & Development	Effective use of Tools	Creating Media	Data & Information	Algorithms	Safety and Security
LKS2									
Year 4									
The internet	✓								✓
Audio production					✓	✓			
Repetition in shapes			✓					✓	
Data logging		✓					✓		
Photo editing					✓	✓			
Repetition in games			✓	✓					
UKS2									
Year 5									
Systems and searching	✓				✓				
Video production				✓		✓			
Selection in physical computing		✓	✓						
Flat-file databases					✓		✓		
Vector graphics					✓	✓			
Selection in quizzes			✓					✓	
Year 6									
Communication and collaboration	✓				✓				
Webpage creation				✓		✓			
Variables in games			✓	✓					
Introduction to spreadsheets					✓		✓		
3D modelling					✓	✓			
Sensing movement		✓	✓						

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Disciplinary Skills Progression: Computing

strand	Computer Science:		Information Technology:	Digital Literacy:	
Year Group	Using physical media	Programming	Creating media	Searching	internet Safety
R	Find letters on a keyboard Move a mouse to control the cursor	Describe the route a robot is taking Follow a route taken by another person after its completion.	Be able to take photos using a device Select colours to use in a digital painting		Identify simple examples of personal data: name, age, location Name ways in which people communicate, including the internet
1	Use a mouse in different ways Use a keyboard to type simple words and navigate	Follow instructions on a computer program Organise instructions	Use digital tools to create a piece of work Save a piece of work Change images and animate simple pictures	Locate an app/ software that they will use for their work	Explain who to trust their personal information with Know when to tell a trusted adult about something they are worried about online
2	Select appropriate ways to use technology based on the device they are using	Create a list of instructions and program a device Debug a simple program to make it work	Use a range of digital paint tools and describe what they have done Save work and retrieve it later Combine different tools in a program to tell a story	Find saved work by searching folders	Explain how passwords can protect personal data Explain what it meant by private and keeping things private Explain how others may feel if something private is shared without permission
3	Use IT in different ways and identify the choices that have been made	Use block programming and explain what a program is doing Debug simple mistakes in presented programs Use sequencing in their program for a specific purpose	Add text and images to a presentation using different programs Use different devices to create media for a specific purpose Analyse given data	Use search engines to find answers to given questions	Explain strategies for creating passwords Report concerns to a trusted adult Explain how online and offline relationships can be different
4	Recognise what media is used for on websites Be able to add content to the world wide web (www)	Use block programming and make changes to affect the outcome Debug mistakes in given programs and suggest different ways to debug	Choose the most effective media to add to a presentation Choose appropriate devices to create media and explain their choices	Refine searches using more precise questions	Describe strategies for keeping information safe Respond to requests online for information

		Use sequencing and repetition in programs	Gather and analyse data online and offline		Describe how to be safe when involved in social activities online
5	Explain that we need tools to find things online Order search results by rank on the world wide web	Use block programming with a variety of devices Debug errors in given programs and algorithms Use sequencing, repetition and selection in programs	Create a variety of software-based media, considering its audience Combine media to enhance their work Collect, analyse and evaluate data	Scrutinise searches, selecting appropriate websites for a given purpose	Explain how free apps share information with others Explain how to get help if people are having problems online with others
6	Be able to access shared files online Identify different ways to communicate and explain them	Write programs for a variety of devices for specific reasons Debug errors through their own programs and algorithms through decomposition into smaller parts Begin to use variables when programming	Select the best software for a task and explain their choice Use critical thinking to give feedback on their own and others' work Choose what data is needed to accomplish a specific task	Act discerningly when evaluating digital content	Explain ways to avoid phishing and scams and how to identify them Describe how things shared privately can have unintended consequences

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Substantive Concepts and Knowledge – Computing

	Networks	Computing Systems	Programming	Design & Development	Effective use of Tools	Creating Media	Data & Information	Algorithms	Safety and Security
KS1	Know examples of technology Know how technology helps us **Know uses of information technology** **Know how information technology benefits us**	Know that hardware is the physical parts of a computer, like the keyboard, mouse and monitor Know that software is the programs that make the computer run Know examples of technology Know how technology helps us **Know uses of information technology** **Know how information technology benefits us** Know that saving work allows you to revisit it later	Know that an instruction is information about how something should be done Know that a program is a set of commands that a computer can run Know that direction is the path along which something or someone moves **Know that debugging is to find and remove errors from computer hardware or software** Know that a set of instructions is a sequence Know that changing a sequence can change the output	Know that an instruction is information about how something should be done Know that direction is the path along which something or someone moves **Know that different technology can be combined to create a desired effect**	Know the features of a good photograph Know that photographs can be changed and may not be a true representation **Know that a pictogram is a diagram that uses pictures to represent data** Know that an E-book is a book that can be read on a computer or tablet	Know the features of a good photograph Know that photographs can be changed and may not be a true representation **Know that different technology can be combined to create a desired effect** Know that an animation is making drawings and models seem to move	Know that data is any information that can be used by a computer Know that some commands can only have yes and no answers Know that objects and people can be sorted by questioning **Know that a pictogram is a diagram that uses pictures to represent data** Know that blocks are used to program an object Know that different blocks affect an object in different ways	Know that an algorithm is a precise step by step set of instructions used to solve a problem or achieve an objective. Know what a given command does **Know that some commands can only have yes and no answers**	Know how to use a computer responsibly.

			Know that blocks are used to program an object Know that different blocks affect an object in different ways						
LKS2	Know that computers can be connected together Know that computer networks can be used to share information	Know that exporting means saving a project so it can be shared Know that email is a form of communication	Know that a sequence of instructions is called a process Know that an output is the result of a program running Know that different sequences can achieve different outputs **Know that a sprite is an image that can be controlled in programming** Know that loop commands repeat instructions **Know that repetition is the redoing of the same command a given number of times.**	Know that using images and text together can show information Know that desktop publishing is used for newspapers and magazines Know that web pages are an example of desktop publishing Know that stop motion is images joined together with one small change each time to animate their images	Know what a search engine is Know that search engines don't always return good results Know that branching databases use closed questions (YES/NO) to refine data Know that data can be sorted through closed questions Know that branching databases are an identification tool Know that desktop publishing is used for newspapers and magazines Know that web pages are an example of	Know that media includes photographs, video and audio Know the purpose of animations within a presentation Know that stop motion is images joined together with one small change each time to animate their images Know that each image taken is called a frame **Know that exporting means saving a project so it can be shared** **Know that using images and text together can show information**	Know that branching databases use closed questions (YES/NO) to refine data Know that data can be sorted through closed questions Know that branching databases are an identification tool	**Know that to repeat means following the same instruction over and over for a set number of times**	Know that you can report any concerns about emails to teachers and parents/guardians

			Know that decomposition is the breaking down of a task into smaller parts **Know that a procedure is a snippet of code that is run multiple times** Know that programming can be written in different languages **Know that to repeat means following the same instruction over and over for a set number of times**		desktop publishing	Know that desktop publishing is used for newspapers and magazines Know that web pages are an example of desktop publishing			
UKS2	Know that email can be used to send different forms of media Know where to get support from Know that computer systems communicate with each other	Know that computer systems communicate with each other **Know that the internet uses addresses to allow communication** **Know that sharing information helps people work collaboratively**	**Know that a variable needs a name and a value** **Know that variables are values that can be set and changed (link to working scientifically)** **Know that variables can include letters or numbers**	Know that a quiz requires you to answer questions and score points Know that quizzes can have different question types Know that games need to be designed to enable playability (ease of play)	Know that the internet uses addresses to allow communication Know that sharing information helps people work collaboratively Know that there are different ways to communicate over the internet	Know that a quiz requires you to answer questions and score points Know that quizzes can have different question types Know that a preview is used to check something before making it final	Know that a database holds records of information Know that fields are the parts of a record and help us search information Know that organising data allows us to answer questions	Know that selection can be used in real life situations to control outputs (taps turning on, lights coming on when it gets dark	Know where to get support from Know that digital photographs and video content may contain inappropriate material Know why there is an age-limit on specific web and mobile platforms

	Know that different search engines can return different results **Know that search engines use different parts of websites to give it a rank to order them** **Know that the Internet uses addresses to allow communication**	**Know that there are different ways to communicate over the internet**	Know that conditions are a way of controlling the flow of actions Know that selection in a program is where a decision needs to be made (IF statements) To know that selection can be used in real life situations to control outputs (taps turning on, lights coming on when it gets dark) Know that there can be more than one way to debug a program Know that emulators are used to run and test programs before being transferred to a physical device	Know that designs can be previewed to enable the creator to check functionality	Know that a controllable device is something that runs a program that is created by a user	Know that a blog is a website written about a theme Know that a blog provides information about an area of interest Know that a video is a visual media format Know that a video is a sequence of clips pieced together in order to tell a story Know that videos need editing before becoming a final piece	using a search tool Know that a quiz requires you to answer questions and score points Know that quizzes can have different question types Know that a preview is used to check something before making it final **Know that there are different types of data that a spreadsheet can hold** **Know that spreadsheets process data to provide the user with information** **Know that charts allow the user to analyse data in a spreadsheet**		

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INTERNET SAFETY

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Internet Safety Curriculum

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
REC					Smartie the Penguin 1	Smartie the Penguin 2
KS1	Hanni and the Magic Window	The S Rule	The M Rule	The A Rule	The R Rule	The T Rule
LKS2	All Fun and Games	ReelLife	Trust Me 1	Trust Me 2	SMART Crew	Are you SMART Online? Quiz
UKS2	All Fun and Games	ReelLife	Group Chats * Ensure resources used are for **Group A**		Videos online	Being Smart with your Smartphone
						Moving on Up (optional KS2 – 3 transition unit)

The internet safety lesson each half term begins the unit of work and is taught before any other computing content.

KS1 SMART video lessons: SMART Video Lessons | Childnet

KS2 ReelLife: ReelLife | Childnet

LKS2 SMART Crew: Watch Full Movie | Childnet

UKS2 Moving on up: Moving on up! | Childnet

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COMPUTING & INTERNET SAFETY CURRICULUM:

CYCLE A

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Curriculum Content - Cycle A

	Autumn 1		Autumn 2		Spring 1		Spring 2		Summer 1		Summer 2	
KS1	Internet Safety	Technology around us	Internet Safety	Digital painting	Internet Safety	Moving a robot	Internet Safety	Programming animations	Internet Safety	Digital music	Internet Safety	Grouping data
LKS2		Connecting computers		Stop-frame animation		Sequencing sounds		Branching databases		Desktop publishing		Events and actions in programs
UKS2		Systems and searching		Video production		Selection in physical computing		Flat-file databases		Introduction to vector graphics		Selection in quizzes

Each unit of work begins with an internet safety lesson, teaching children about the potential dangers of life online; how to keep themselves safe and what to do if online content disturbs or worries them.

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COMPUTING & INTERNET SAFETY CURRICULUM:

CYCLE B

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Curriculum Content - Cycle B

	Autumn 1		Autumn 2		Spring 1		Spring 2		Summer 1		Summer 2	
KS1	Internet Safety	Digital writing**	Internet Safety	IT around us	Internet Safety	Digital photography	Internet Safety	Pictograms	Internet Safety	Robot algorithms	Internet Safety	Programming quizzes
LKS2		The Internet		Audio production		Photo editing		Data logging		Repetition in shapes		Repetition in games
UKS2		Communication and collaboration		Web-page creation		Variables in games		Introduction to spreadsheets		3D modelling		Sensing movement

** This unit will introduce the components of a desktop PC, but Teachers will also need to revisit the basic vocabulary and key learning from lesson 3 (mouse skills) of **Technology around us** from Cycle A

Each unit of work begins with an internet safety lesson, teaching children about the potential dangers of life online; how to keep themselves safe and what to do if online content disturbs or worries them.

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COMPUTING & INTERNET SAFETY CURRICULUM:

Vocabulary

Cycle A Cycle B

Year 1					
Computing systems and networks - Technology around us	**Creating media - Digital painting**	**Creating media - Digital writing**	**Data and information – Grouping**	**Programming A - Moving a robot**	**Programming B – Programming animations**
technology, computer, mouse, trackpad, keyboard, screen, double-click, typing.	paint program, tool, paintbrush, erase, fill, undo, shape tools, line tool, fill tool, undo tool, colour, brush style, brush size, pictures, painting, computers	word processor, keyboard, keys, letters, type, numbers, space, backspace, text cursor, capital letters, toolbar, bold, italic, underline, mouse, select, font, undo, redo, format, compare, typing, writing.	object, label, group, search, image, property, colour, size, shape, value, data set, more, less, most, fewest, least, the same	Bee-Bot, forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, route, plan, algorithm, program.	Scratch Jr, command, sprite, compare, programming, area, block, joining, start, run, program, background, delete, reset, algorithm, predict, effect, change, value, instructions, design.
Year 2					
Computing systems and networks - IT around us	**Creating media - Digital music** (link to composition in Charanga)	**Creating media - Digital photography**	**Data and information – Pictograms**	**Programming A - Robot algorithms**	**Programming B - Programming quizzes**
Information technology (IT), computer, barcode, scanner/scan	music, quiet, loud, feelings, emotions, pattern, rhythm, pulse, pitch, tempo, rhythm, notes, create, emotion, beat, instrument, open, edit.	device, camera, photograph, capture, image, digital, landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, format, framing, lighting,	more than, less than, most, least, common, popular, organise, data, object, tally chart, votes, total, pictogram, enter, data, compare, objects, count, explain, attribute, group, same, different, conclusion, block diagram, sharing	instruction, sequence, clear, unambiguous, algorithm, program, order, prediction, artwork, design, route, mat, debugging, decomposition	sequence, command, program, run, start, outcome, predict, blocks, design, actions, sprite, project, modify, change, algorithm, build, match, compare, debug, features, evaluate, decomposition, code.

Cycle A Cycle B

Year 3					
Computing systems and networks - Connecting computers	**Creating media – Desktop Publishing**	**Creating media – Stop-Frame Animation**	**Data and information – Branching Databases**	**Programming A – Sequencing Sounds**	**Programming B – Events and Actions in Programs**
digital device, input, process, output, program, digital, non-digital, connection, network, switch, server, wireless access point, cables, sockets	text, images, advantages, disadvantages, communicate, font, style, landscape, portrait, orientation, placeholder, template, layout, content, desktop publishing, copy, paste, purpose, benefits.	animation, flip book, stopframe, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency, evaluation, delete, media, import, transition.	attribute, value, questions, table, objects, branching, database, objects, equal, even, separate, structure, compare, order, organise, selecting, information, decision tree.	Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, sequence, event, task, design, run the code, order, note, chord, algorithm, bug, debug, code.	motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, pen, design, action, debugging, errors, setup, code, test, debug, actions.
Year 4					
Computing systems and networks - The internet	**Creating media – Audio Production**	**Creating media – Photo Editing**	**Data and information – Data Logging**	**Programming A – Repetition in Shapes**	**Programming B – Repetition in Games**
internet, network, router, security, switch, server, wireless access point (WAP), website, web page, web address, routing, web browser, World Wide Web, content, links, files, use, download, sharing, ownership, permission, information, accurate, honest, content, adverts	audio, microphone, speaker, headphones, input device, output device, sound, podcast, edit, trim, align, layer, import, record, playback, selection, load, save, export, MP3, evaluate, feedback.	image, edit, digital, crop, rotate, undo, save, adjustments, effects, colours, hue, saturation, sepia, vignette, image, retouch, clone, select, combine, made up, real, composite, cut, copy, paste, alter, background, foreground, zoom, undo, font.	data, table, layout, input device, sensor, logger, logging, data point, interval, analyse, dataset, import, export, logged, collection, review, conclusion.	Logo (programming environment), program, turtle, commands, code snippet, algorithm, design, debug, pattern, repeat, repetition, count-controlled loop, value, trace, decompose, procedure.	Scratch, programming, sprite, blocks, code, loop, repeat, value, infinite loop, count-controlled loop, costume, repetition, forever, animate, event block, duplicate, modify, design, algorithm, debug, refine, evaluate.

Cycle A Cycle B

Year 5					
Computing systems and networks – Systems and Searching	**Creating media – Introduction to Vector Graphics**	**Creating media – Video Production**	**Data and information – Flat-File Databases**	**Programming A – Selection in Physical Computing**	**Programming B – Making Quizzes**
system, connection, digital, input, process, storage, output, search, search engine, refine, index, bot, ordering, links, algorithm, search engine optimisation (SEO), web crawler, content creator, selection, ranking.	vector, drawing tools, object, toolbar, vector drawing, move, resize, colour, rotate, duplicate/copy, zoom, select, align, modify, layers, order, copy, paste, group, ungroup, reuse, reflection	video, audio, camera, talking head, panning, close up, video camera, microphone, lens, mid-range, long shot, moving subject, side by side, angle (high, low, normal), static, zoom, pan, tilt, storyboard, filming, review, import, split, trim, clip, edit, reshoot, delete, reorder, export, evaluate, share.	database, data, information, record, field, sort, order, group, search, value, criteria, graph, chart, axis, compare, filter, presentation.	microcontroller, USB, components, connection, infinite loop, output component, motor, repetition, count-controlled loop, Crumble controller, switch, LED, Sparkle, crocodile clips, connect, battery box, program, condition, Input, output, selection, action, debug, circuit, power, cell, buzzer	selection, condition, true, false, count-controlled loop, outcomes, conditional statement, algorithm, program, debug, question, answer, task, design, input, implement, test, run, setup, operator
Year 6					
Computing systems and networks – Communication and Collaboration	**Creating media – Webpage Creation**	**Creating media – 3D Modelling**	**Data and information – introduction to Spreadsheets**	**Programming A – Variables in Games**	**Programming B – Sensing Movement**
communication, protocol, data, address, Internet Protocol (IP), Domain Name Server (DNS), packet, header, data payload, chat, explore, slide deck, reuse, remix, collaboration, internet, public, private, oneway, two-way, one-to-one, one-to-many	website, web page, browser, media, Hypertext Markup Language (HTML), logo, layout, header, media, purpose, copyright, fair use, home page, preview, evaluate, device, Google Sites, breadcrumb trail, navigation, hyperlink, subpage, evaluate, implication, external link, embed.	TinkerCAD, 2D, 3D, shapes, select, move, perspective, view, handles, resize, lift, lower, recolour, rotate, duplicate, group, cylinder, cube, cuboid, sphere, cone, prism, pyramid, placeholder, hollow, choose, combine, construct, evaluate, modify.	data, collecting, table, structure, spreadsheet, cell, cell reference, data item, format, formula, calculation, spreadsheet, input, output, operation, range, duplicate, sigma, propose, question, data set, organised, chart, evaluate, results, sum, comparison, software, tools.	variable, change, name, value, set, design, event, algorithm, code, task, artwork, program, project, code, test, debug, improve, evaluate, share, assign, declare	Micro:bit, MakeCode, input, process, output, flashing, USB, trace, selection, condition, if then else, variable, random, sensing, accelerometer, value, compass, direction, navigation, design, task, algorithm, step counter, plan, create, code, test, debug.