Computing Curriculum

Curriculum Intent
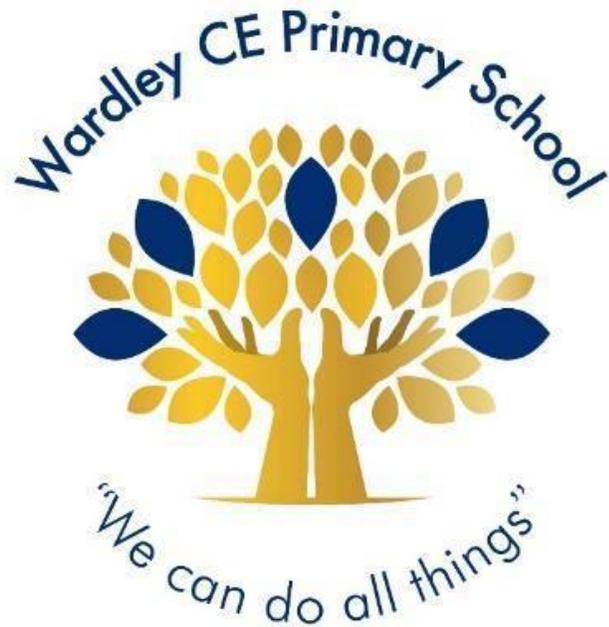
The curriculum intent for Wardley CE Primary school aims to:

- **Be ever-evolving**, providing opportunities for children to develop as independent, confident, resilient, successful & motivated learners striving for the pursuit of excellence who know how to make a positive and transformational contribution to their community and wider global society.

- **Be rooted in the school's Christian ethos**, encouraging our pupils to grow in self-awareness and becoming advocates of social justice, adaptable to any social context.

- **Be ambitious** in our aim for pupils to develop the communication skills necessary for learning and life, promoting enjoyment, high expectations and standards across all subject areas.

- **Be memorable**: providing diverse, social, moral, spiritual and cultural (SMSC) rich opportunities from which children learn and develop a range of transferable skills.

- **Be aspirational**, cultivating a sense of personal pride in achievement, provide a purpose and relevance for learning and ultimately to help every student to find strengths and interests.

- **Be inspiring**, to empower pupils to respect each other and themselves, show respect and understanding for people of all faiths, race and gender, and for all living things, promoting stewardship and ensuring children are well prepared for life in a rapidly changing world.

Computing Intent
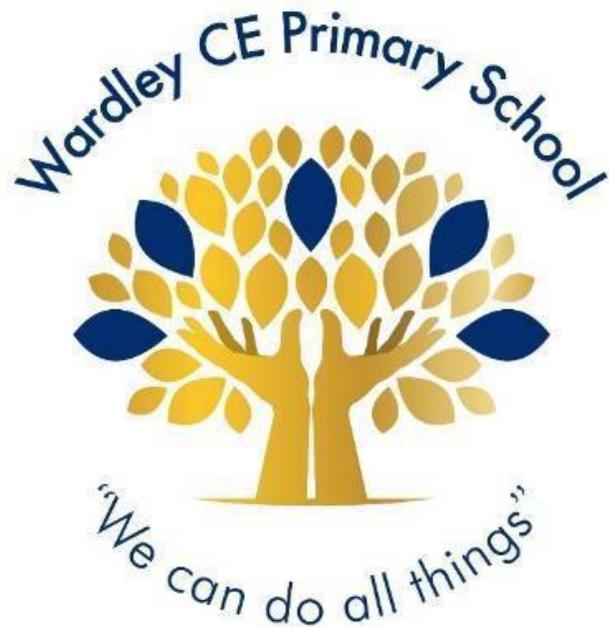
Our aim is to provide a high-quality computing education which equips children to use computational thinking and creativity to understand and change the world.

The curriculum will teach children key knowledge about how computers and computer systems work, and how they are designed and programmed. Learners will have the opportunity to gain an understanding of computational systems of all kinds, whether or not they include computers.

By the time they leave, children will have gained key knowledge and skills in the three main areas of the computing curriculum:

- Computer science (programming and understanding how digital systems work).

- Information technology (using computer systems to store, retrieve and send information)

- Digital literacy (evaluating digital content and using technology safely and respectfully).

The objectives within each strand support the development of learning across the key stages, ensuring a solid grounding for future learning and beyond.

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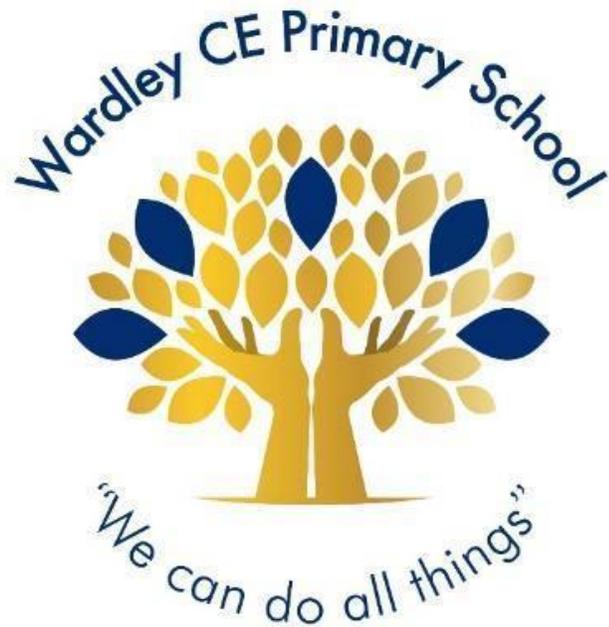
Early Years

By the end of the Early Years Foundation Stage children should recognise that a range of technology is used in places such as homes and schools, that children can select and use technology for particular purposes. Used well technology can excite and motivate children, and it offers practitioners the chance to promote skills and observe progress across all areas of learning and development – in ways that would either be more difficult or impossible without it.

The September 2020 release of Development Matters outlines how effective teaching and learning gives children the opportunity to play and explore, participate in active learning and create and think critically. Tasks are outlined for each area of the EYFS framework, although, at Wardley, many other opportunities exist to use technology with younger children linked to a topic studied within class.

Computing Curriculum

Computing overview

Wardley CE Primary School

"We can do all things"
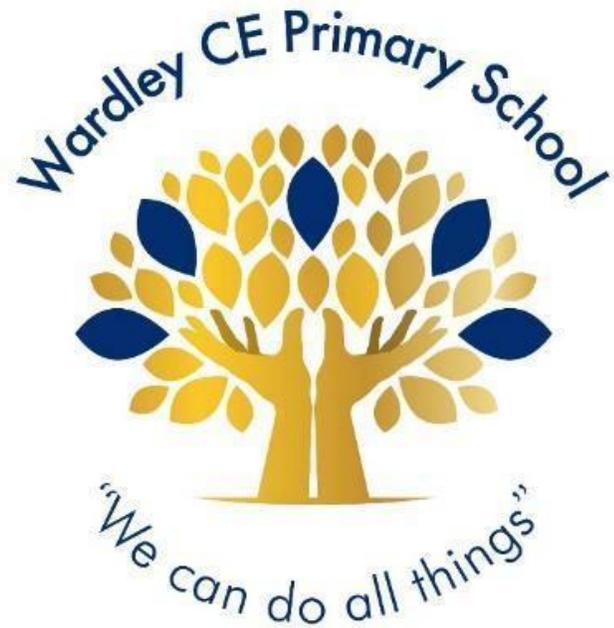
Computing Teaching Cycle

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33

Year Group

Year 1:
- Unit 1.1 Online Safety & exploring Purple Mash (4 weeks)
- Unit 1.7 Coding (6 weeks)
- Unit 1.8 Spreadsheets (3 weeks)
- Unit 1.4 Lego Builders (3 weeks)
- Unit 1.5 Maze Explorers (3 weeks)
- Unit 1.6 Animated Story Books (5 weeks)
- Unit 1.3 Pictograms (3 weeks)
- Unit 1.2 Grouping & Sorting (2 weeks)
- Unit 1.9 Tech outside School (2)

Year 2:
- Unit 2.2 Online Safety (3 weeks)
- Unit 2.1 Coding (5 weeks)
- Unit 2.3 Spreadsheets (4 weeks)
- Unit 2.8 Presenting Ideas (4 weeks)
- Unit 2.6 Creating Pictures (5 weeks)
- Unit 2.4 Questioning (5 weeks)
- Unit 2.5 Effective Search (3 weeks)
- Unit 2.7 Making Music (3 weeks)

Year 3:
- Unit 3.2 Online Safety (3 weeks)
- Unit 3.1 Coding (6 weeks)
- Unit 3.3 Spreadsheets (3 weeks)
- Unit 3.4 Touch Typing (4 weeks)
- Unit 3.6 Branching Databases (4 weeks)
- Unit 3.8 Graphing (3 weeks)
- Unit 3.5 Email (6 weeks)
- Unit 3.7 Simulations (3 weeks)

Year 4:
- Unit 4.2 Online Safety (4 weeks)
- Unit 4.1 Coding (6 weeks)
- Unit 4.3 Spreadsheets (6 weeks)
- Unit 4.4 Writing for different audiences (5 weeks)
- Unit 4.6 Animation (3 weeks)
- Unit 4.5 Lego (4 weeks)
- Unit 4.7 Effective Search (3 weeks)
- Unit 4.8 Hardware Investigators (2 weeks)

Year 5:
- Unit 5.2 Online Safety (3 weeks)
- Unit 5.1 Coding (6 weeks)
- Unit 5.3 Spreadsheets (6 weeks)
- Unit 5.7 Concept Maps (4 weeks)
- Unit 5.5 Game Creator (5 weeks)
- Unit 5.6 3D Modelling (4 weeks)
- Unit 5.4 Databases (4 weeks)

Year 6:
- Unit 6.2 Online Safety (3 weeks)
- Unit 6.1 Coding (6 weeks)
- Unit 6.3 Spreadsheets (5 weeks)
- Unit 6.7 Quizzing (6 weeks)
- Unit 6.4 Blogging (5 weeks)
- Unit 6.5 Text Adventures (5 weeks)
- Unit 6.6 Networks (3 weeks)

Legend:
- Coding and Computational thinking
- Internet and Email
- Spreadsheets
- Writing and presenting
- Art and Design
- Databases and graphing
- Communication and networks
- Music

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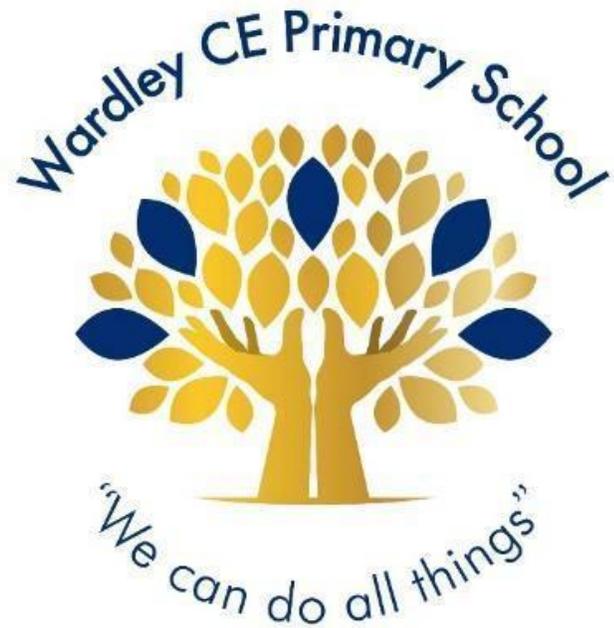
Threshold Concepts: Disciplinary Knowledge

Computing: Progression of knowledge

	Algorithms (Code)	Create programs (Code)	Reasoning (Code)
	Pupils should be taught to understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions	*Pupils should be taught to create and debug simple programs*	*Pupils should be taught to use logical reasoning to predict the behaviour of simple programs*
By the end of Key Stage 1	• create a series of instructions and plan a journey for a programmable toy	• create, store and retrieve digital content	
	• understand that algorithms are used on digital devices	• write a simple program and test it	• predict what the outcome of a simple program will be (logical reasoning).

Computing: Progression of knowledge

	Using technology (Collect)	Uses of IT beyond school (Communicate)	Safe use (Connect)
	Pupils should be taught to use technology purposefully to create, organise, store, manipulate and retrieve digital	*Pupils should be taught to recognise common uses of information technology beyond school*	*Pupils should be taught to 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*
By the end of Key Stage 1	• use a website and a camera • record sound and play back	• talk about some of the IT uses in their own home	• use technology safely • keep personal information private
	• understand that programs require precise instructions • organise, retrieve and manipulate digital content	• know how technology is used in school and outside of school	• know where to go for help if concerned.

Computing: Progression of knowledge

	Create programs (Code)	Develop programs (Code)	Reasoning (Code)	Networks (Communicate)
	Pupils should be taught to design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	*Pupils should be taught to use sequence, selection, and repetition in programs; work with variables and various forms of input and output*	*Pupils should be taught to use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs*	*Pupils should be taught to understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration*
By the end of lower Key Stage 2	• write programs that accomplish specific goals	• design a sequence of instructions, including directional instructions	• discern when it is best to use technology and where it adds little or no value	• navigate the web to complete simple searches
	• give an 'on-screen' robot specific instructions that takes them from A to B	• experiment with variables to control models	• make an accurate prediction and explain why they believe something will happen (linked to programming)	• know how to search for specific information and know which information is useful and which is not
By the end of upper key stage 2	• use technology to control an external device	• develop a program that has specific variables identified	• analyse and evaluate information reaching a conclusion that helps with future developments	
	• write a program that combines more than one attribute	• develop a sequenced program that has repetition and variables identified	• design algorithms that use repetition and 2-way selection	

Computing: Progression of knowledge

	Search engines (Collect)	Using programs (Communicate)	Safe use (Connect)
	Pupils should be taught to use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	*Pupils should be taught to 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*	*Pupils should be taught to use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact*
By the end of lower Key Stage 2	• use a range of software for similar purposes • collect and present information	• understand what computer networks do and how they provide multiple services	• use technology respectfully and responsibly • Know different ways they can get help if concerned
	• select and use software to accomplish given goals	• produce and upload a podcast	• recognise acceptable and unacceptable behaviour using technology
By the end of upper key stage 2	• understand how search results are selected and ranked	• combine sequences of instructions and procedures to turn devices on and off	• understand that they have to make choices when using technology and that not everything is true and/or safe
	• be aware that some search engines may provide misleading information	• present the data collected in a way that makes it easy for others to understand	• Be increasingly aware of the potential dangers in using aspects of IT and know when to alert someone if feeling uncomfortable

Computing: Progression of skills

Code
This concept involves developing an understanding of instructions, logic and sequences.

By the end of Key Stage One		
	Motion	Control motion by specifying the number of steps to travel, direction and turn.
	Looks	Add text strings, show and hide objects and change the features of an object.
	Sounds	Select sounds and control when they are heard, their duration and volume.
	Draw	Control when drawings appear and set the pen colour, size and shape.
	Events	Specify user inputs (such as clicks) to control events.
	Control	Specify the nature of events (such as a single event or a loop).
	Sensing	Create conditions for actions by waiting for a user input (such as responses to questions like: What is your name?).

Computing: Progression of skills

	Connect	Communicate	Collect
	This concept involves developing an understanding of how to safely connect with others.	This concept involves using apps to communicate one's ideas.	This concept involves developing an understanding of databases and their uses.
By the end of Key Stage One	• Participate in class social media accounts. • Understand online risks and the age rules for sites.	• Use a range of applications and devices in order to communicate ideas, work and messages.	• Use simple databases to record information in areas across the curriculum.

Computing: Progression of skills

Code
This concept involves developing an understanding of instructions, logic and sequences.

By the end of Lower Key Stage Two	Motion	Use specified screen coordinates to control movement.
	Looks	Set the appearance of objects and create sequences of changes.
	Sounds	Create and edit sounds. Control when they are heard, their volume, duration and rests.
	Draw	Control the shade of pens.
	Events	Specify conditions to trigger events.
	Control	Use IF THEN conditions to control events or objects.
	Sensing	Create conditions for actions by sensing proximity or by waiting for a user input (such as proximity to a specified colour or a line or responses to questions).
	Variables and lists	Use variables to store a value. Use the functions define, set, change, show and hide to control the variables.

Operators
Use the Reporter operators
() + ()
() - ()
() * ()
() / ()
to perform calculations.

Computing: Progression of skills

	Connect	Communicate	Collect
	This concept involves developing an understanding of how to safely connect with others.	This concept involves using apps to communicate one's ideas.	This concept involves developing an understanding of databases and their uses.
By the end of Lower Key Stage Two	• Contribute to blogs that are moderated by teachers. • Give examples of the risks posed by online communications. • Understand the term 'copyright'. • Understand that comments made online that are hurtful or offensive are the same as bullying. • Understand how online services work.	• Use some of the advanced features of applications and devices in order to communicate ideas, work or messages professionally.	• Devise and construct databases using applications designed for this purpose in areas across the curriculum.

Computing: Progression of skills

Code
This concept involves developing an understanding of instructions, logic and sequences.

By the end of Upper Key Stage Two		
	Motion	Set IF conditions for movements. Specify types of rotation giving the number of degrees.
	Looks	Change the position of objects between screen layers (send to back, bring to front).
	Sounds	Upload sounds from a file and edit them. Add effects such as fade in and out and control their implementation.
	Draw	Combine the use of pens with movement to create interesting effects.
	Events	Set events to control other events by 'broadcasting' information as a trigger.
	Control	Use IF THEN ELSE conditions to control events or objects.
	Sensing	Use a range of sensing tools (including proximity, user inputs, loudness and mouse position) to control events or actions.
	Variables and lists	Use lists to create a set of variables.

Operators	**Operators**	**Operators**
Use the Boolean operators	Use the Reporter operators	Pick Random () to ()
() < ()	() + ()	Join () ()
() = ()	() - ()	Letter () of ()
() > ()	() * ()	Length of ()
()and()	() / ()	() Mod () This reports the remainder
()or()		after a division calculation
Not()		Round ()
to define conditions.		() of ().

Computing: Progression of skills

	Connect	Communicate	Collect
	This concept involves developing an understanding of how to safely connect with others.	This concept involves using apps to communicate one's ideas.	This concept involves developing an understanding of databases and their uses.
By the end of Upper Key Stage Two	• Collaborate with others online on sites approved and moderated by teachers. • Give examples of the risks of online communities and demonstrate knowledge of how to minimise risk and report problems. • Understand and demonstrate knowledge that it is illegal to download copyrighted material, including music or games, without express written permission, from the copyright holder. • Understand the effect of online comments and show responsibility and sensitivity when online. • Understand how simple networks are set up and used.	• Choose the most suitable applications and devices for the purposes of communication. • Use many of the advanced features in order to create high quality, professional or efficient communications.	• Select appropriate applications to devise, construct and manipulate data and present it in an effective and professional manner.

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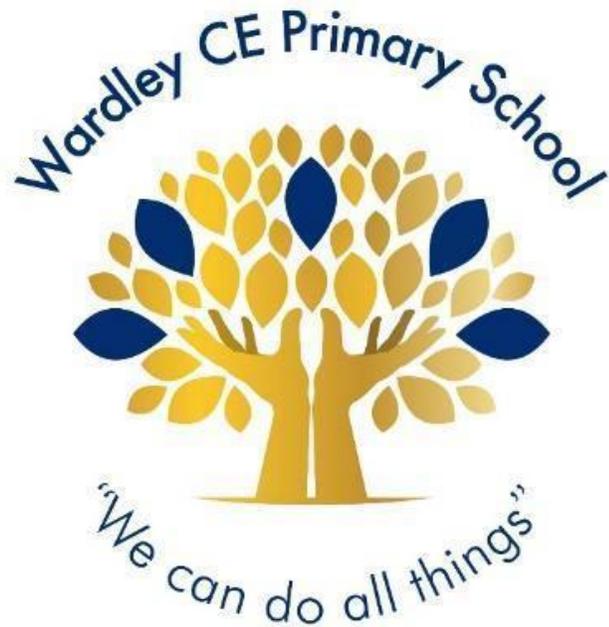
Progression of Vocabulary

Vocabulary is an essential part of teaching and learning at Wardley - vocabulary can unlock a wealth of understanding. As teachers, we consistently use accurate, technical vocabulary, which support pupils' conceptual understanding.

In many instances, vocabulary acts as a label that identifies the concept. To connect a concept with the appropriate term, we begin by introducing and explaining the key term, then unpack the related concept; this makes it more concrete for your pupils, before we repack it and then once again apply the vocabulary label. This ensures that we connect these labels with the concepts that they describe and embed the concept in our pupils' understanding and, subsequently, the terminology will become part of their own vocabulary.

Computing
Year 1

Connect & Communicate		Code				Collect		
Online Safety	**Technology outside school**	**Coding**	**Maze Explorers**	**Grouping and Sorting**	**Lego Builders**	**Pictograms**	**Animated Story Books**	**Spreadsheets**
Alert	Computer	Action	Algorithm	Activities	Algorithm	Collect Data	Animation	Button
Avatar	Technology	Algorithm	Challenge	Criteria	Code	Compare	Background	Calculations
Button		Background	Command	Describe	Computer	Data	Category	Cell
Device		Click	Delete	Equal	Debugging	Pictogram	Clip-art gallery	Clip-art
File Name		Code	Direction	Groups	Instructions	Record Results	Copy	Count tool
Filter		Code blocks	Instruction	Less than	Machine	Title	Drop-down menu	Data
Home Screen		Coding	Left and Right	More than	Program	Totals	E-book	Delete
Icon		Code view	Route	Sort	Recipe	Visual	Edit	Image
Login		Command	Undo		Sequence		Eraser	Lock cell
Log out		Debug\ Debugging	Unit				Features	Move cell
Menu		Design View					Font	Row
My Work Area		Event					Sound	Select
Notification		Execute					Overwrite	Speak tool
Password		Instruction					Paint tools	Spreadsheet
Private		Object					Paste	Value
Saving		Output					Play Mode	
Search		Plan					Redo	
Shared Folder		Programmer					Save	
Textbox		Properties					Sound effect	
Topic Area		Run					Text	
Tool bar		Scale					Undo	
Typing		Scene					Voice recording	
Writing Template		Software						
		Sound						
		When Clicked						

Computing
Year 2

Connect & Communicate		Code	Collect					
Online Safety	Effective Searching	Coding	Questioning	Spreadsheets	Creating pictures	Making Music	Presenting Ideas
Attachment	Browser	Action	Avatar	Addition	Art	Bars	E-book
Digital footprint	Device	Algorithm	Binary Tree	Block graph	Clip-art	Beat	Fact file
Display Board	Digital Footprint	Background	Data	Cell	Diagonal	Compose	Fiction
Email	Domain	Bug	Database	Coins	Dilute	Note	Mind Map
Filter	Internet	Button	Field	Column	eCollage	Tune	Multiple-choice
Identifying	Network	Click events	Information	Copy	Fill	Repeat	Node
Internet	Search Engine	Collision detection	Pictogram	Count tool	Horizontal	Sound Effect	Non-fiction
Personal	Web Address	Collision detection action	Question	Cut	Impressionism	Soundtrack	Presentation
information	Web Page	Collision detection event	Record	Data	Line	Speed	Quiz
Private	Web Site	Command	Search	Drag	Palette	Tempo	
information	World Wide Web	Debug\ Debugging	Sort	Equals	Parallel	Volume	
Protection		Event		Equals tool	Pointillism		
Reply		Execute		Image value	Repeating pattern		
Search		Image		Label	Rotated		
Secure		Implement		Paste	Stamps		
Sharing		Instructions		Price	Style		
		Interaction		Speak tool	Surrealism		
		Interval		Table	Symmetry		
		Object		Toolbox	Vertical		
		Object Name		Total			
		Predict					
		Properties					
		Run					
		Scale					
		Scene					
		Sequence					
		Test					
		Text					
		Timer					
		Turtle Object					
		When Clicked					
		When Key Event					
		When Swiped Event					

Computing Year 3								
Connect & Communicate		**Code**	**Collect**					
Online Safety	Email	Coding	Spreadsheets	Databases	Touch Typing	Simulations	Graphing	Presenting with Microsoft PowerPoint / Google Slides
Appropriate	Address Book	Action	Advanced	Binary Tree	Keys	Advantages	Axis	Animation
Blog	Attachment	Alert	Mode	Branching	Posture	Analysis	Chart	Audio
Inappropriate	BCC – Blind	Algorithm	Bar graph	Database	Spacebar	Decision	Column	Border Properties
Internet	Carbon Copy	Background	Cell address	Data	Typing	Disadvantages	Data	Duration
Password	CC – Carbon	Bug	Data	Database		Evaluation	Graph	Editing
Personal	Copy	Button	Equals	Debugging		Modelling	Investigation	Fill colour
information	Communication	Click events	Less than			Point-of-view	Row	Font formatting
Permission	Compose	Code	More than			Realistic	Sorting	Layer
Reliable Source	Email	Collision	More than,			Simulation	Survey	Media
Reputable	Inbox	detection event	less than &			Solution	Tally Chart	Presentation
source	Link	Command	Equal tool			Unrealistic	Title	Presentation Design
Spoof	Mind mapping	Debug\	Pie Chart					Preview
Verify	Node	Debugging	Quiz tool					Review
Vlogs	Password	Degrees	Spinner tool					Slide• Slideshow
Website	Personal	Event	Table					Sound effect
	Information	Flowchart						Textbox
	Save to draft	Implement						Theme
	Trusted Contact	Input						Timing
		Interval						Transition
		Nest						Video
		Object						WordArt
		Predict						
		Properties						
		Repeat						
		Right-Angle						
		Run						
		Scene						
		Sequence						
		Test						
		Timer						
		Turtle Object						

Computing Year 4								
Connect & Communicate	Code			Collect				
Online Safety	Coding	Hardware Investigators	Logo	Spreadsheets	Writing for Different Audiences	Animation	Effective Searching	Making Music
AdFly	Action	Components	Debugging	Average	Campaign	Animation	Balanced view	BPM
Attachment	Alert	CPU	Grid	Budget	Format	FPS (Frame Per Second)	Easter eggs	Dynamics
Citation	Algorithm	Graphics Card	Logo	Calculations	Font	Frame	Internet	Harmonious
Collaborate	Background	Hard Drive	Logo	Chart	Genre	Onion skinning	Key words	Melody
Collaborative database	Button	Hardware	Commands	Column	Opinion	Pause	Reliability	Pitch
Cookies	Code blocks	Input	(e.g. FD, BK, RT, LT)	Data	Reporter	Stop motion	Results page	Pulse
Copyright	Command	Motherboard	Multi Line	Decimal place	Viewpoint		Search engine	Rhythm:
Data analysis	Co-ordinates	Network Card	Mode	Equals to tool				Tempo
Digital footprint	Debug\ Debugging	Output	Pen Down	Format Cell				Texture
Malware	Design	Peripherals	Pen Up	Formula				Synths
Phishing	Event	RAM	Prediction	Formula Wizard				
Plagiarism	Execute	Software	Procedure	Line graph				
Ransomware	Flowchart		Repeat	Percentage				
Report	If' statement		Run Speed	Place value				
SMART rules	'If/Else' statement		SETPC	Random number tool				
Software	Input		SETPS	Resize				
Spam	Nest			Row				
Watermark:	Object			Spinner tool				
	Prompt			Timer				
	Implement			Totals				
	Predict							
	Repeat							
	Repeat until							
	Run							
	Properties							
	Selection							
	Sequence							
	Timer							
	Variable							

Computing
Year 5

Connect & Communicate			Code			Collect		
Online Safety	**Concept Maps**	**Word Processing**	**Coding**	**Game Creator**	**External Devices**	**Databases**	**Spreadsheets**	**3D Modelling**
citation	Concept	Bulleted list	abstraction	Evaluation	Algorithm	Arrange	Rows	2D
collaborate	Concept Map	Caps lock	action	Feedback	Emulator /	Avatar	Data	3D
communication	Connection	Caption	algorithm	Image	simulator	Chart	Spreadsheets	CAD – Computer aided Design
copyright	Collaborate	Copy and paste	concatenation	Instructions	External device	Collaborative	Columns	Design brief
creative	Heading	Copyright	debugging	Promotion	Host	Data	Formula	Net
Commons	Sub-Heading	Creative	decomposition	Quest	Input	Field	Format	Pattern fill
Licence	Node	commons	efficient	Scene	Qr code	Database	Advance mode	Points
encrypt	Presentation	Cursor	event	Screenshot	Output	Field	Formula bar	
identity theft	Mode	Document	flowchart	Texture	sensor	Group	Formula wizard	
malware	Story Mode	Font	function	Theme		Record	Totalling tool	
ownership		Hyerlink	input			Search	Variable	
PEGI ratings		Merge cells	nesting			Sort		
phishing		Page orientation	object			Statistics		
password		Formatting	output					
personal		Text wrapping	physical system					
information		Word art	properties					
reliable source			repeat					
SMART rules			selection					
Spoof			sequence					
Validity			simplify					
			timer					
			variable					

Computing
Year 6

Connect & Communicate	Code		Collect				
Online Safety	Coding	Networks	Text Adventures	Understanding Binary	Blogging	Spreadsheets	Quizzing
Data Analysis	Action	Data	Debug\	Binary	Approval	Advanced mode	Audience
Digital Footprint	Algorithm	DNS (Domain Name Server)	Debugging	Bit	Archive	Budget	Audio
Inappropriate	Command	Ethernet	Function	Decimal	Blog	Chart	Case-Sensitive
Location sharing	Concatenation	Hosting	QR Code	Denary	Blog post	Columns	Clipart
Password	Co-ordinates	Hub\Switch	Repeat	Digit	Collaborate	Count (How Many?) Tool	Clone
PEGI rating	Debug\ Debugging	Internet	Sprite	Game States	Commenting	Data	Copy\Paste
Phishing	Decomposition	IP address	Text Adventure	Integer	Connections	Dice Tool	Database
Print Screen	Event	ISP (Internet Service Provider)	Selection	Microprocessor	Nodes	Expense	Database Record
Screen Time	Execute\ Run	LAN (Local Area Network)	Variables	Nanotechnology	Vlog	Format Cell	Database Field
Secure websites	Flowchart	Network		Nibble, Byte, Kilobyte, Megabyte, Gigabyte and Tetrabyte		Formula	Image
Spoof	Function	Router		Switch		Formula Bar	Image Filter
	Input	Search engine		Transistor		Formula wizard	Selfie
	Launch Command	WAN (Wide Area Network)		Variable		Percentage	Statistics
	Object	Web Page				Probability	Undo\Redo
	Output	Web server				Profit	Preview
	Predict	Website				Rows	Quiz
	Procedure	WLAN: (Wireless Local Area Network)				Spreadsheet	
	Properties	Wi-Fi:					
	Repeat	World Wide Web					
	Repeat until						
	Selection						
	Sequence						
	Simulation						
	String						
	Tabs						
	Text Adventure						
	Text Object						
	Timer						
	Turtle Object						
	Variable						
	x and y properties						