

Computing

Curriculum Progression of the Knowledge Essentials

Computing Curriculum

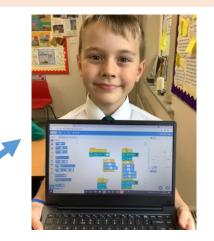
Knowledge Rich Curriculum

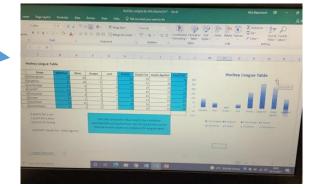
Knowledge has driven the philosophy in developing the Computing curriculum. The knowledge essentials specify what children should know in as much detail as possible and content sequenced such that there is a coherent flow. This ensures ideas build on secure foundations, staged towards challenging goals. Careful sequencing ensures that elements are regularly returned to, supporting pupils to accumulate knowledge over time, feeding previous topics into current topics supported by Practice and Retrieval strategies.

In designing the curriculum, we have considered a broad range of knowledge forms with a focus on being able to articulate declarative and procedural knowledge:

- Declarative knowledge consists of facts, rules and principles and the relationships between them. This is the 'knowing that' of our curriculum.
- Procedural knowledge is knowledge of methods or processes that can be performed. This
 is the 'knowing how' or our curriculum.

The Computing curriculum reflects careful thinking as to what is to be taught, the rationale for it, the sequencing of learning and the relationships between the forms of knowledge. As a result, pupils know more, remember more and can do more.





Computing Curriculum

How is the Computing Curriculum Organised?

The subject has been planned with two key lenses – Key Strands and Key Pillars.



Pillars



Online safety

Using the internet



Word Processing



Digital media

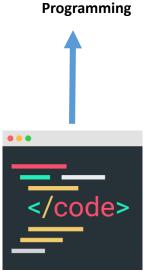




Information technology



Presentation skills



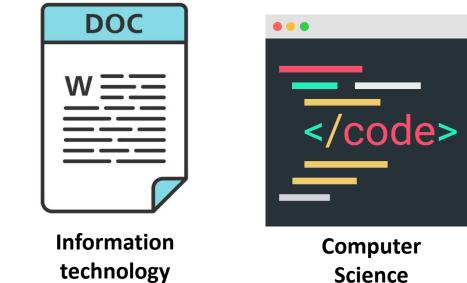


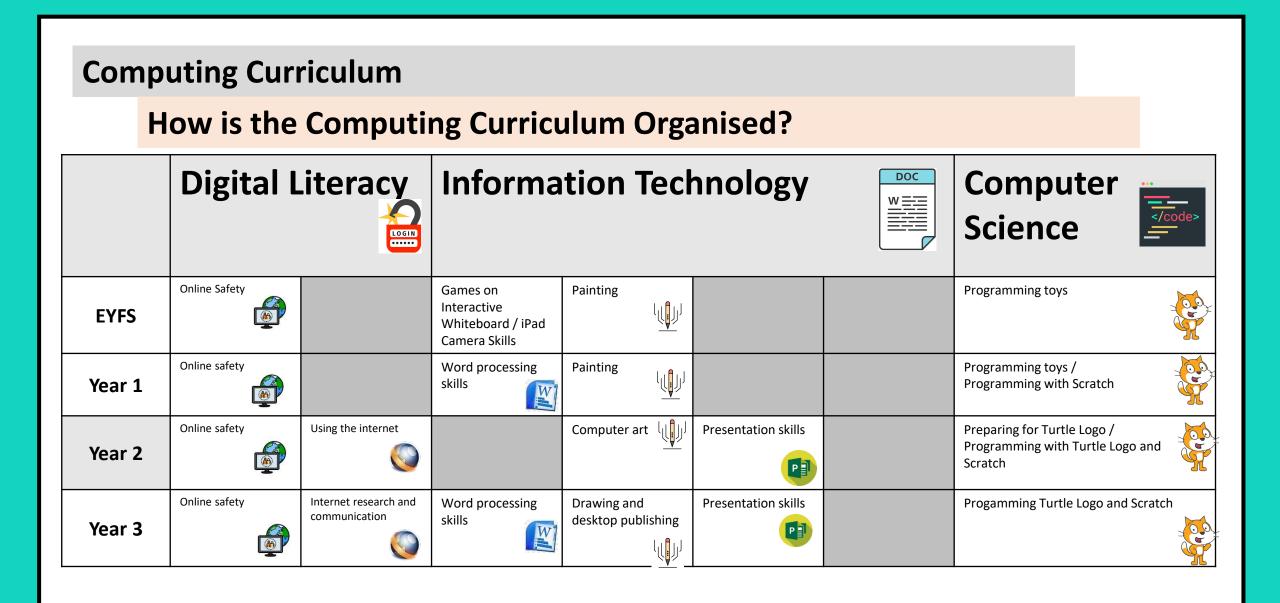
Computing Curriculum

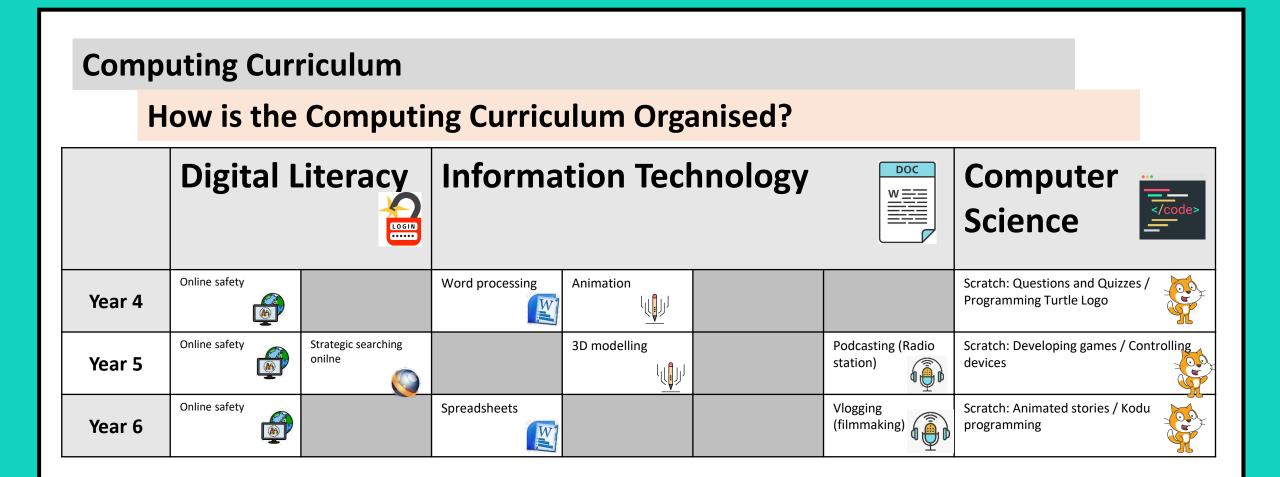
What are the Computing Pillars??

Pillars build knowledge sequentially with opportunities to revisit and build on children's prior learning – deepening knowledge and understanding. Links are made in learning through recurring themes throughout our curriculum.









Strand	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Online Safety	 Online Safety Children know to ask for help if needed Children know what personal information is and know that it should not be shared online 	 Online Safety type their name and the date on a piece of work they have created choose the correct Safe Search filter when using a search engine make links between the online and offline world recall rules for Internet safety recognise which personal information they should keep safe from strangers help to construct an email. 	 Online Safety know what 'digital footprint' means know that people can use the information they put online know that a digital footprint contains information about a person identify keywords that will give good search results use a website to search for information begin to identify possible dangers online identify websites suitable for their age know when to ask an adult for advice about accessing a website know what to do if a website makes them uncomfortable talk about what people might want to know about a website give their opinion about a website say what they like and dislike about a website begin to consider who a website could be aimed at identify unkind online behaviour know what to do if they think someone is being unkind to them online know how to safely search for information online choose appropriate websites for their age. 	 Online Safety recognise cyberbullying identify a safe person to tell if they encounter cyberbullying know that cyberbullying can happen via a range of devices identify adverts online identify at argeted advert explore how companies use websites to promote products create a strong password explain why a strong password is important explain what privacy settings are discuss email as a form of communication identify an email that they should not open write an email with an address and subject know how to safely send an email know how to safely receive an email identify online communities they are a part of identify online communication discuss the positive and negative aspects of online communication in real life and online discuss what they have learnt about online safety communicate their ideas with a group clearly and listen to others' contributions use what they know about online safety to plan a party using online methods 	 Online Safety define cyberbullying know how to respond to a hurtful message or comment online access a trusted search engine understand that different search terms give different results know what plagiarism is identify which information to keep private online explain what digital citizenship is tell someone else at least one way to stay safe online identify comments or messages that may be hurtful to others edit their own messages and comments to make sure they are kind understand that search results are ranked choose an appropriate number of words for a search term explain why it may be dangerous to share private information explain how to be a good digital citizen tell someone else more than one way to stay safe online 	 Online Safety identify a spam email explain what to do with spam email understand why they should cite a source explain the rules for creating a strong password create a strong password using a set of rules know that not everything they see online is true explain how to stay safe online behaviour identify a dangerous spam email create multiple strong passwords for use across different platforms spot citations online alter a photograph. 	 Online Safety say what bullying and cyberbullying are say how people should deal with cyberbullying understand why I should ask an adult if I am unsure identify warning signs that a website might not be secure identify personal information explain what to do if I am asked or told something online which makes me uncomfortable explain some of the dangers of revealing personal information to an online friend choose an appropriate action online to stay safe identify a situation I should be careful in online understand how a stereotype can be harmful. look in the address bar of a website so check for security identify the lock symbol in an address bar explain what the SMART acronym means explain what a stereotype is compare gender stereotypes.





Strands	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Online Safety vocabulary	Online safety Online safe not safe share don't share private help	Online safety Online Key Safe Communicate Meet Email Accept Address Reliable Tell	Online safety Digital Online Search Keyword Website Search engine Cyberbullying Information Personal Private	Online safety Online Internet Cyberbullying Email Password Device Digital Safety Technology Social media	Online Safety Online Safety Cyberbullying Message Search Search engine Search results Plagiarism Citation Social media	Online Safety Spam Email Link Attachment Junk Inbox Research Password Secure Photo	Online safety Cyberbullying Reporting Anonymous Victim Security Secure Private Personal Policy Https
		Device Keyboard Search engine Image Text Save Folder Name date copyright	Profile Account Bullying Report Phone Laptop Tablet App comment Digital footprint	Website Advertisement Privacy settings Secure Digital footprint Community Inbox Forum Comments	Profile Account Private Public Digital citizen Responsibility Community Personal information Share permission	Social media Personal information Digital citizen Filter Source Edit Plagiarism Bibliography Cite citation	Domain Media Attachments Site Browser Gender Stereotype Message Instant messaging



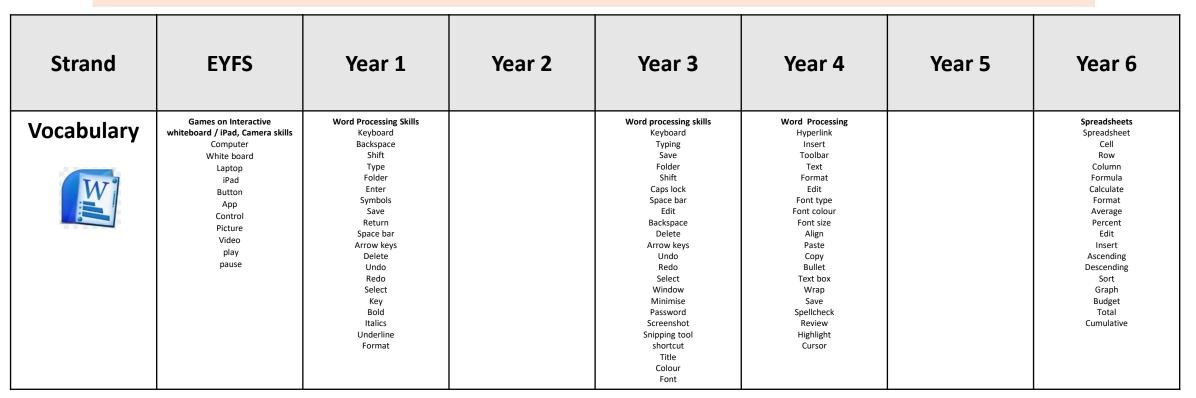
Strand	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Using the internet			 Using the Internet search using the words "for kids" follow a weblink locate their own blog understand how to blog safely and responsibly identify search results that will give some useful information know where to find the address of a link log in and post a blog or comments. 	 Internet Research and Communication To know and understand how word order affects the results returned. They will know how to bookmark or favourite a page and name different types of online communication. Children will know what to do if they feel uncomfortable when communicating online. They will be able to identify how they should behave online. Identify which word order gives the better results when searching online and be able to support this with examples. They will be able to share a webpage with others. Children will be able to research the different types of online communication used by their peers. 		 Strategic searching online Find out information on the internet using search engines Use a search engine effectively by refining the search term Know how to use Boolean operators to refine a search Identify what makes a website reliable and trustworthy Understand how search engines work Understand and explain what page ranking is Use SEO to improve a web page 	



Strands	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Using the internet vocabulary			Using the Internet Internet World wide web Search Search engine Results Google Bing Yaho Kidrex	Internet Research and Communication Webpage Social media Search Link Bing Google Yahoo		Internet Research and webpage design Internet World wide web Search Search engine Google Browser Tab Window	
			Browser Link Web page Back Reload Research Photo Camera Tablet Upload blog			Layout Text Font Colour Image Video Animation Website Hyperlink Share	

Strand	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Word processing	 Games on Interactive whiteboard / iPad, Camera skills Nursery: I can play simple games on the Interactive Whiteboard by pressing buttons I can switch a camera on and off I can play simple games on the Interactive Whiteboard by dragging and dropping items I can take photos on the camera I can play simple games on the Interactive Whiteboard by dragging and dropping items I can take photos on the camera I can record videos on the camera I know to ask for help if needed Reception I can record videos on the camera I know to ask for help if needed Reception I can record videos on the camera I know to ask for help if needed I can record videos on the camera I know to ask for help if needed I can record videos on the camera I know to ask for help if needed I can record videos on the camera I know to ask for help if needed I can rease content and understands how to charge the cameras 	 Word Processing Skills Type with two hands Use shift, space and enter correctly Use undo and redo Make text bold, italic or underline Save their work in their folder Edit text using backspace, delete and the arrow keys. Format the font Select single words. 		 Word Processing Skills Use undo and redo. Make text bold, italic or underline. Select text in different ways. Change case. Align text. Select single words. Cut, copy and paste text. Format the font. Insert images. Copy a screenshot into another application. Use keyboard shortcuts. 	 Word Processing select, edit and manipulate text in different ways insert an image into a document format an image use formatting tools to improve the layout use the spellcheck tool insert a simple table change the size of the page use some of the main keyboard shortcuts suggest ways to improve a layout apply specific effects to an image add a spelling to the spelling dictionary add or delete rows or columns in a table suggest ways to change a table type at an appropriate speed choose a relevant website to link a document to create a hyperlink. 		 Spreadsheets Enter text and numbers into a spreadsheet. Identify and refer to cells by row and column. Begin to enter formulae with the SUM function Be able to enter formulae into cells. Edit data and discuss the effect on results. Use further functions including AVERAGE, MIN and MAX. Create graphs. Design their own spreadsheet for a specific purpose



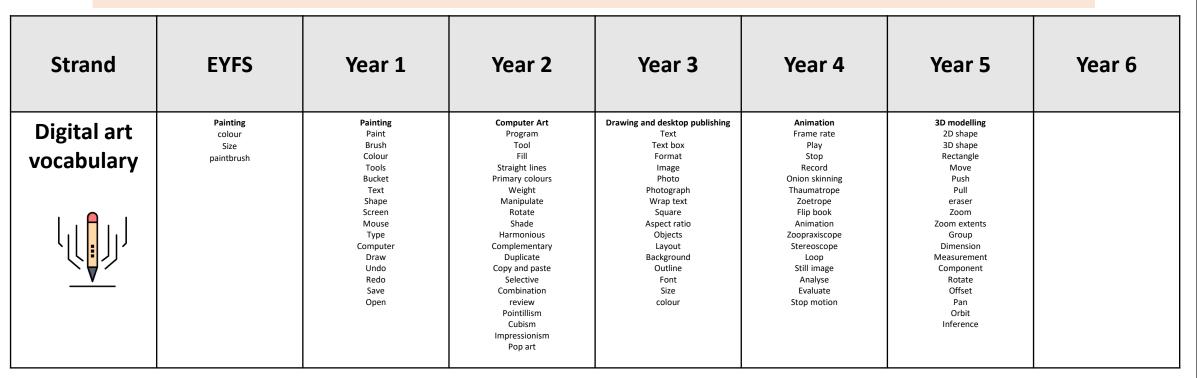




Thread Progression	n
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Strand	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
soft Whi • I car and on p • I car and on p	n mark make on paint tware on the Interactive inteboard n select brushes, colours d rubbers when drawing paint software n select brushes, colours d rubbers when drawing paint software on n select brushes, colours d rubbers when drawing paint software n use various tools such orush, pens, stamps, sers and shapes with	 Painting Paint with different colours. Paint with different brushes. Create shapes. Save their paintings in their folder. Fill an area with a colour. Undo and redo. Add text. 	 Computer Art access an appropriate program for achieving a specific task; switch between program tools to produce different techniques; alter the formatting of a tool to adjust the colour or size. recreate a piece of art using a computer program; manipulate shapes and objects to recreate an art style. 	 Drawing and Desktop Publishing Draw objects. Insert text boxes and images. Order and group objects. Move, resize and arrange text boxes and images effectively 	 Animation Explain what is meant by animation Create a series of linked frames that can be played as a short animation. Control and adjust a time slider to locate a different point in a film clip. Insert images to create a simple stop-motion animation short film clip. Evaluate the good and bad points about some animation software. Describe one or more traditional methods of animation. Make slight changes to an image using onion skinning, understanding the term. Use a time slider to find a specific point in a film clip to insert or edit an object. Edit and refine images in a stop-motion animation short film clip to insert or good and bad points. 	 3D Modelling Draw 2D shapes or lines. Draw simple 3D models Manipulate 2D shapes into 3D shapes. Import 3D models from the 3D warehouse. Use a range of SketchUp tools including: shape, push, pull, orbit, pan, zoom, erase and fill. Draw and manipulate 3D models independently. Use inference points to draw lines and shapes. Use a wide range of SketchUp toolbar and guides, tape measure, zoom extents and the 3D warehouse. 	



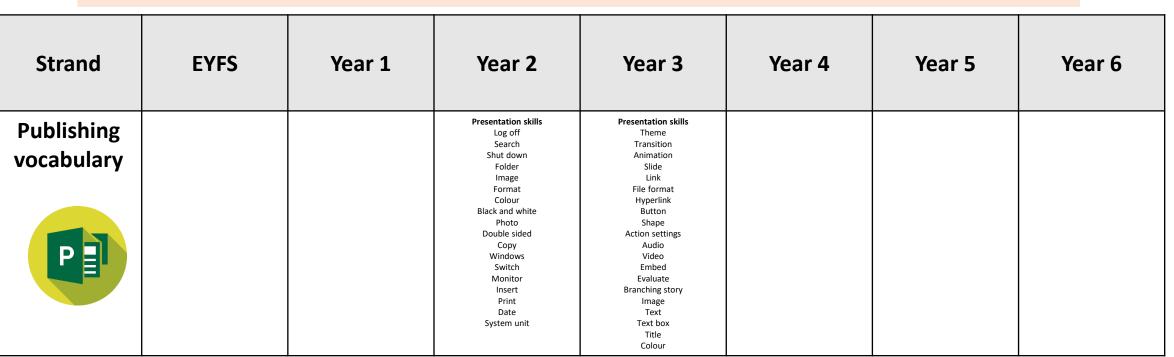








Strand	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Publishing			 Presentation Skills Insert slides, add and type in a text box Create folders. Print files. Add images. Format text and text boxes 	 Presentation Skills Create a simple presentation Create shapes Create a hyperlink to another slide Use slide transitions Insert audio and video files (where possible) Record audio onto a slide Plan a branching story Create simple slide templates Copy and organise slides as required 			





Strand	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Digital media						 Podcasting (Radio Station) Record and play their own sounds in recording software Import an existing sound file into recording software to play Choose appropriate software for sound recording Plan and record a radio advert Listen to and improve on their own recordings by re- recording 	 Vlogging (Film-Making) plan and write a script using appropriate software search for relevant information using appropriate websites use a digital video camera (or similar device) to record plan suitable questions to ask an interviewee import video files into video editing software. plan additional elements for
						 Locate and download existing sound files to be imported into recording software Combine two or more tracks to make a new, original recording Plan and record appropriate audio content for a podcast Evaluate what features makes good quality audio content 	 film-making such as locations and props evaluate whether information is reliable or not speak clearly into the camera when being recorded frame an appropriate filming shot when interviewing arrange video files to form a complete film



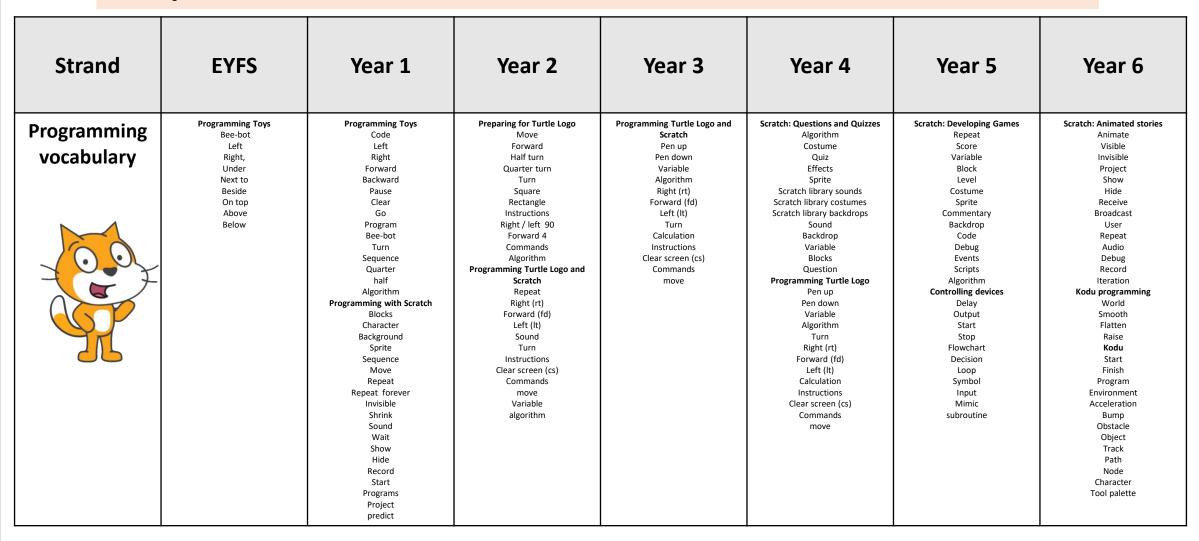
Strand	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Digital media vocabulary						Podcasting (Radio Station) Play Stop Record Skip Digital content Mute Podcast Output Input	Vlogging (Film-making) Documentary Film Production Pre-production Post-production Improvise Interview Location Prop
						Sound Download Jingle Audio Voiceover Edit Waveform gain	Copyright Source Shot Angle Close-up Frame Zoom Import Convert Upload Screening



Computer Science

Strand	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Progra mming .	Programming Toys I can use positional language and extend this to using a BeeBots or instructing a friend to move I can confidently programme a BeeBot. I can talk about technology and how it can help us direct ourselves – Google Maps. 	 Programming Toys say what an algorithm is say why it is important to be precise when writing an algorithm check their work for mistakes (debug) program a robot (Bee-Bot) using the arrow buttons start their programming sequence again if they need to check their work for mistakes to debug a program plan and check an algorithm Programming with Scratch open the Scratch and start a new project add new characters and backgrounds use blocks for movement in different directions create short sets of sequenced instructions use different end blocks, including repeat forever change the size of characters with an instruction block program two or more characters with instructions at the same time 	 Preparing for Turtle Logo Walk forward a number of steps. Turn accurately 90° (a quarter turn). Walk squares and rectangles. Give and follow instructions. Programming Turtle Logo & Scratch Draw lines of different lengths using the fd command. Move blocks into the Scripts Area. Snap blocks together to combine commands. Turn the turtle using rt 90 and It 90. Draw squares and rectangles. Create simple algorithms using a number of different blocks. Use the repeat and green flag blocks to control algorithms. 	 Programming Turtle Logo & Scratch Create and debug algorithms to draw regular polygons using the repeat command/ block (Turtle Logo and Scratch) Draw shapes with spaces between using penup and pendown (Turtle Logo) Change and alter the pen settings (Scratch) 	 Scratch: Questions and Quizzes Write a program which accomplishes a specific goal. Create a program that includes a logical sequence. Debug a program they have written Use repetition and selection. Work with variables and adjust these depending on the effect they wish to create. Understand and use the duplicate function. Demonstrate that they understand how to combine a range of different effects to create their own quiz. Programming Turtle Logo Write procedures using simple algorithms. Change the colour of the pen. Write text using the label command. Draw shapes using setpos or setxy. Fill shapes in different sizes as required 	 Scratch - Developing Games move and edit blocks as part of an algorithm. program an algorithm as a sequence of game instructions with actions and consequences. Controlling Devices Follow written instructions to draw a simple flowchart Insert symbols into a flowchart Add inputs into a flowchart. Identify conventional symbols, understanding the process of each stage. Create a program to control a simple sequence. Modify symbols in a flowchart for effect. Create flowcharts for multiple inputs and outputs. Use decisions and subroutines. Program inputs and outputs 	 Scratch: Animated Stories Select appropriate characters to match a scene. Animate characters with movement and speech in a story scene. Use broadcast and receive blocks correctly in code. Use show and hide blocks correctly in code. Create a sequence of story scenes with added audio. Structure and sequence the animation of characters in each scene. Use the repeat command to create animation effect. Make a character visible or invisible at the correct times. Kodu Programming Open Kodu and navigate the programming environment using keyboard or mouse. Add objects to a world and program them using When and Do instructions. Plan and design the features of an original virtual environment. Program a character to move around a track. Create a path for a character to follow. Follow instructions given in the Kodu programming environment. Describe the actions of a sequence of Kodu commands. Use tools to change the size of the ground and raise or lower the landscape. Decompose code into smaller parts and explain it in their own words. Create a race track with an end goal for a game. Program a character to follow a path.

Computer Science





Key Concept Progression

Safety - The condition of being protected from or unlikely to cause danger or risk online



EYFS	KS1	LKS2	UKS2
Use online activities with the support and permission of adults.	 Ask adults before sharing information about themselves online Know that people sometimes behave differently online Understand the interconnected nature of the internet and how sharing information can be a good thing, but must be done so with boundaries to keep us safe 	 Understand their responsibilities as a digital citizen. Recognise risk by thinking critically about the information they read on line 	 Think critically about the information they share with others (e.g. though social media, apps and games)

Creation - Using technology to bring something into existence

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EYFS	KS1	LKS2	UKS2
 Select and use technological devices to capture images, sounds and mark making. 	• Combine media from multiple sources (within the classroom) to create a new piece of work digitally.	• Select and create digital media from pre- selected sources (by the teacher) to create a representation of a concept or data set	 Select, manipulate, edit and create digital media from a wide range of sources to create a representation of a concept or data set

Key Concept Progression

Coding - Computational thinking to compose a program which achieves a specific goal



EYFS	KS1	KS2
 Understand that technology plays a role in our lives. Understand cause and effect 	 Compose a simple set of instructions to complete a set task/purpose (algorithm). Understand when these instructions need to be altered or changed (debug). 	Combine algorithms to complete more complex tasks.