Rodings Primary School

COMPUTING LEARNING LADDER



Computing Learning Ladder

Explore Discover Create

Progression of Skills

		COMPUTER SCIENCE - Progression of Skills	
	EYFS	Y٦	
	Learning how to operate a camera to take photographs of meaningful creations or moments.	Learning how to operate a camera or tablet to take photos and videos.	Understanding wi different compone
	Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary.	Learning how to explore and tinker with hardware to find out how it works.	Recognising that follows instruction
Hardware	Recognising and identifying familiar letters and numbers on a keyboard.	Recognising that some devices are input devices and others are output devices.	Learning how we want it to do via it
	Developing basic mouse skills such as moving and clicking.	Learning where keys are located on the keyboard.	Using greater con tablets or comput
			Developing confic touch typing.
	n/a	n/a	n/a
Networks and data			
representation			

Y2

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e know that technology is doing what we its output.

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fidence with the keyboard and the basics of

		COMPUTER SCIENCE	- Progression of Skills	
	Y3	Y4	Y5	
Hardware	Understanding what the different components of a computer do and how they work together. Drawing comparisons across different types of computers. Learning about the purpose of routers.	Using tablets or digital cameras to film a weather forecast. Understanding that weather stations use sensors to gather and record data which predicts the weather.	Learning that external devices can be programmed by a separate computer. Learning the difference between ROM and RAM. Recognising how the size of RAM affects the processing of data. Understanding the fetch, decode, execute cycle.	Lea how Usii to c Und coc Ide sca Und with dow files
Networks and data representatio n	Understanding the role of the key components of a network. Identifying the key components within a network, including whether they are wired or wireless. Understanding that websites and videos are files that are shared from one computer to another. Learning about the role of packets. Understanding how networks work and their purpose. Recognising links between networks and the internet. Learning how data is transferred.	Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration.	Learning the vocabulary associated with data: data and transmit. Learning how the data for digital images can be compressed. Recognising that computers transfer data in binary and understanding simple binary addition. Relating binary signals (Boolean) to the simple character-based language, ASCII. Learning that messages can be sent by binary code, reading binary up to eight characters and carrying out binary calculations. Understanding how bit patterns represent images as pixels.	Unc

earning about the history of computers and owned by they have evolved over time.

sing the understanding of historic computers design a computer of the future.

nderstanding and identifying barcodes, QR odes and RFID.

lentifying devices and applications that can can or read barcodes, QR codes and RFID

nderstanding how corruption can happen ithin data during transfer (for example when ownloading, installing, copying and updating es).

nderstanding that computer networks rovide multiple services.

		COMPUTER SCIENCE - Progression of Skills	
	EYFS	Y٦	
Computational Thinking	Using logical reasoning to understand simple instructions and predict the outcome	Learning that decomposition means breaking a problem down into smaller parts. Using decomposition to solve unplugged challenges. Using logical reasoning to predict the behaviour of simple programs. Developing the skills associated with sequencing in unplugged activities. Following a basic set of instructions. Assembling instructions into a simple algorithm.	Understanding wh different compone Recognising that & follows instruction Learning how we k want it to do via its Using greater cont tablets or compute Developing confid touch typing.
Programming	Following instructions as part of practical activities and games. Learning to give simple instructions. Experimenting with programming a Bee-bot/Blue- bot and learning how to give simple commands. Learning to debug instructions, with the help of an adult, when things go wrong.	Programming a Floor robot to follow a planned route. Learning to debug instructions when things go wrong. Using programming language to explain how a floor robot works. Learning to debug an algorithm in an unplugged scenario.	Using logical thin testing and expla Using an algorith Using loop blocks instruction more t

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ninking to explore software, predicting, plaining what it does.

thm to write a basic computer program.

ks when programming to repeat an e than once.

		COMPUTER SCIENCE	- Progression of Skills	
	Y3	Y4	Y5	
	Using decomposition to explain the parts of a laptop computer.	Using decomposition to solve a problem by finding out what code was used.	Decomposing animations into a series of images.	De
	Using decomposition to explore the code behind an animation.	Using decomposition to understand the purpose of a script of code.	Decomposing a program without support.	Usi prc
Computatio nal	Using repetition in programs.	Identifying patterns through unplugged activities.	Decomposing a story to be able to plan a program to tell a story.	Wr a p
Thinking	Using logical reasoning to explain how simple algorithms work.	Using past experiences to help solve new	Predicting how software will work based on previous experience.	
	Explaining the purpose of an algorithm. Forming algorithms independently	problems. Using abstraction to identify the important parts when completing both plugged and unplugged activities.	Writing more complex algorithms for a purpose.	
	Using logical thinking to explore more	Creating algorithms for a specific purpose.	Programming an animation.	Del
	complex software; predicting, testing and explaining what it does.	Coding a simple game.	Iterating and developing their programming	pro
	Incorporating loops to make code more	Using abstraction and pattern recognition to	as they work.	Rer
	efficient.	modify code.	Confidently using loops in their programming.	Usi
Programmi	Continuing existing code.	Incorporating variables to make code more efficient.	Using a more systematic approach to debugging code, justifying what is wrong	Pro
ng	Making reasonable suggestions for how to	encient.	and how it can be corrected.	Cha
	debug their own and others' code.		Writing code to create a desired effect.	Eva
			Using a range of programming commands.	Pre pur
			Using repetition within a program.	
			Amending code within a live scenario.	

ecomposing a program into an algorithm.

Ising past experiences to help solve new problems.

Vriting increasingly complex algorithms for purpose.

Debugging quickly and effectively to make a program more efficient.

emixing existing code to explore a problem.

sing and adapting nested loops.

Programming using the language Python.

Changing a program to personalise it. Evaluating code to understand its purpose.

Predicting code and adapting it to a chosen purpose.

		INFORMATION TECHNOLOGY - Progression of Skills	5
	EYFS	Y٦	
Using software	Using a simple online paint tool to create digital art.	Using a basic range of tools within graphic editing software. Taking and editing photographs. Developing control of the mouse through dragging, clicking and resizing of images to create different effects. Developing understanding of different software tools.	Developing word copying and pasti Using word proces Using software (ar animations. Creati
Using email and interest searches	n/a	Recognising devices that are connected to the internet. Searching and downloading images from the internet safely. Understanding that we are connected to others when using the internet.	Searching for appl
Using data	Representing data through sorting and categorising objects in unplugged scenarios. Representing data through physical pictograms. Exploring branch databases through physical games.	Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc. Using representations to answer questions about data. Using software to explore and create pictograms and branching databases.	Collecting and inp

d processing skills, including altering text, sting and using keyboard shortcuts.

cessing software to type and reformat text.

(and unplugged means) to create story ating and labelling images.

propriate images to use in a document.

what online information is.

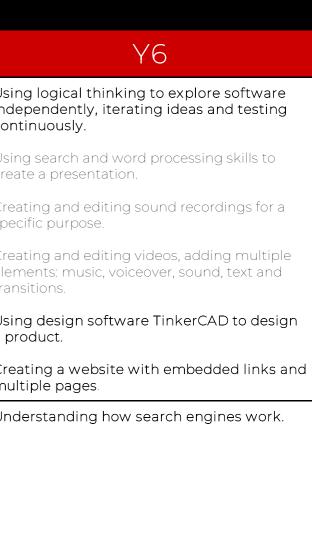
nputting data into a spreadsheet.

a from a spreadsheet.

	Recognising common uses of information technology, including beyond school.	Learning how con
	Understanding some of the ways we can use the internet.	
Wider use of technology		

		COMPUTER SCIENCE	- Progression of Skills	
	Y3	Y4	Y5	
Using software	Taking photographs and recording video to tell a story. Using software to edit and enhance their video adding music, sounds and text on screen with transitions.	 Building a web page and creating content for it. Designing and creating a webpage for a given purpose. Use online software for documents, presentations, forms and spreadsheets. Using software to work collaboratively with others. 	Using logical thinking to explore software more independently, making predictions based on their previous experience. Using the software programme Sonic Pi/Scratch to create music. Using the video editing software to animate. Identify ways to improve and edit programs, videos, images etc.	Usi ind cor Usi Cre spe Cre eler trar Usi a pi Cre mu
Using email and internet searches	Learning to log in and out of an email account. Writing an email including a subject, 'to' and 'from.' Sending an email with an attachment. Replying to an email.	Understanding why some results come before others when searching. Using keywords to effectively search for information on the internet. Understanding that information found by searching the internet is not all grounded in fact. Searching the internet for data.	Developing searching skills to help find relevant information on the internet. Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns.	Un

omputers are used in the wider world.



Using data	databases: field, record, data. Learning about the pros and cons of digital versus paper databases. Sorting and filtering databases to easily retrieve information. Creating and interpreting charts and graphs to understand data.	Weather. Recording data in a spreadsheet independently. Sorting data in a spreadsheet to compare using the 'sort by' option. Designing a device which gathers and records sensor data	or dangerous places. Understanding how data might be used to tell us about a location.	RFII Gat Crea
Wider use of technology	Understanding the purpose of emails. Recognising how social media platforms are used to interact.	Understanding that software can be used collaboratively online to work as a team.	Learn about different forms of communication that have developed with the use of technology.	Lea it ha Lea pro

	DIGITAL LITERACY - Progression of Skills	
EYFS	۲٦	
Recognising that a range of technology is used for different purposes. Learning to log in and log out.	Logging in and out and saving work on their own account. When using the internet to search for images, learning what to do if they come across something online that worries them or makes them feel uncomfortable. Understanding how to interact safely with others online. Recognising how actions on the internet can affect others. Recognising what a digital footprint is and how to be careful about what we post.	Learning how to cr Understanding ho online and what to that makes them Identifying whethe online. Learning to be res and ask for their p
		Learning strategies online is true.

	DIGITAL LITERACY -	Progression of Skills	
Y3	Y4	Y5	

nderstanding how barcodes, QR codes and FID work.

athering and analysing data in real time.

reating formulas and sorting data within preadsheets.

earning about the Internet of Things and how has led to 'big data'.

earning how 'big data' can be used to solve a roblem or improve efficiency.



create a strong password.

how to stay safe when talking to people t to do if they see or hear something online m feel upset or uncomfortable

her information is safe or unsafe to be shared

espectful of others when sharing online r permission before sharing content.

ies for checking if something they read



Recognising that different information is shared online including facts, beliefs and opinions.	Recognising that information on the internet might not be true or correct and that some sources are more trustworthy than others.	Identifying possible dangers online and learning how to stay safe.	Lear impa
opinions.	sources are more trustworthy than others.	Evaluating the pros and cons of online	Leari
Learning how to identify reliable information when searching online.	Learning to make judgements about the accuracy of online searches.	communication.	repu
Learning how to stay safe on social media.	Identifying forms of advertising online.	Recognising that information on the internet might not be true or correct and learning ways	Unde pass
Learning now to stay sale of social media.	identifying forms of advertising ornine.	of checking validity.	pass
Considering the impact technology can have	Recognising what appropriate behaviour is		Lear
on mood.	when collaborating with others online.	Learning what to do if they experience bullying	onlir
Learning about cyberbullying.	Reflecting on the positives and negatives of time spent online.	online.	Using
Learning that not all emails are genuine,		Learning to use an online community safely	Reco
recognising when an email might be fake and what to do about it.	Identifying respectful and disrespectful online behaviour.		preve

Key Vocabulary (by unit)

Unit	Key Vocabulary
	EYFS
Programming Bee-bots	algorithm, arrow, back, backwards, Bee-Bot, circle, debug, direction, directions, forward, instructions, left, program, right, route, sequence, straight on, turn
All About Instructions	adjective, algorithm, bend down, blindfold, debug, describe, duck, first, follow, give, hop, instructions, last, left, next, order, predict, prediction, right, run, second, sequence, shuffle, skip, stand still, step over, stop, straight on, third, tiptoe, timer, turn, two-part instructions, under, walk around
Introduction to Data	altogether, bigger than, branch database, categorise, category, colour, collect, column, count, data, describe, divide, equal, graph, group, height, in total, least popular, length, less, more, most popular, pattern, pictogram, record, row, share, size, smaller than, sort, square, texture, thicker than, thinner than, weight

earning about the positive and negative npacts of sharing online.

earning strategies to create a positive online putation.

nderstanding the importance of secure asswords and how to create them.

earning strategies to capture evidence of nline bullying in order to seek help.

sing search engines safely and effectively.

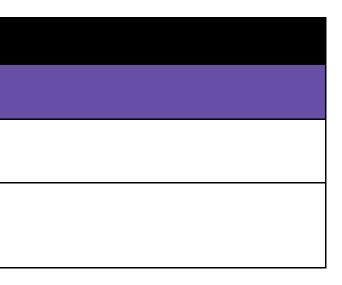
ecognising that updated software can help to event data corruption and hacking.

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arrow, click, computer, computer safety, computer tower, cursor, drag, drop, keyboard, left click, letters, le Using a mouse, mouse control, move, numbers, paint, password, personal, protect, right click, secure, security, sta computer	
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Unit	Key Vocabulary
	Y٦
Improving	account, click, ctrl, cursor, drag, drag and drop, digital photograph, drop, duplicate, keyboard, layers, log on/ in, log out/ off, menu, mouse, mouse
Mouse Skills	pointer, password, right click, screen (monitor), software, tool, username
Algorithms	algorithm, automatic, bug, chunks, clear, code, debug, decompose, decomposition, device, directions, input, instructions, manageable, motion,
Unplugged	order, organise, output, precise, programming, problem, robot, sensor, sequence, solution, specific, steps, tasks, virtual assistant
Introduction to	bar chart, block graph, branching database, categorise, chart, click and drag, compare, count, data, data collection, data record, data
Data	representation, edit, input, keyboard, line graph, mouse, information, label, pictogram, pie chart, process, record, resize, sort, table, tally, values
Bee-Bots	algorithm, artificial intelligence, Bee-Bot, clear, code, debug, demonstration, filming, inputting, instructions, pause, precise, predict, program, tinker, video, video recording (Option 2 only: emulator, virtual)

Unit	Key Vocabulary		
	Y2		
What is a computer?	battery, buttons, camera, computer, desktop, device, digital, digital recorder, electricity, function, input, invention, keyboard, laptop, monitor, mouse, output, paying till, scanner, screen, system, tablet, technology, video, wires		
Online Safety	accept, comment, consent, content, deny, emojis, offline, online, password, permission, personal information, pop-ups, pressure, private information, reliable, share, terms and conditions, trusted adult		



Algorithms and Debugging	abstraction, algorithm, artificial intelligence, bug, clear, correct, data, debug, decompose, error, key features, loop, predict, unnecessary
Data handling	algorithm , astronaut, data, digital, digital content, experiment, galaxy, insulation, interactive map, International Space Centre, International Space Station, interpret, laboratory, monitor, planet, satellite, sensor, space, temperature, thermometer, water reservoir

Unit	Key Vocabulary	
	Y3	
Networks and the internet	cables, component, connection, corrupted, data, desktop, device, DSL (digital subscriber line), fibre, file, internet, laptop, network, network map, network switch, packets, radio waves, router, server, submarine cables, tablet, text map, The Cloud, web server, website, website trackers, WiFi, wired, wireless, Wireless Access Points, World Wide Web	
Journey inside a computer	algorithm, assemble, CPU (central processing unit), data, decompose, desktop, disassemble, GPU (graphics processing unit), hard drive, HDD (hard disk drive), infinite loop, input, keyboard, laptop, memory, microphone, monitor, mouse, output, photocopier, program, QR code, RAM (random access memory), ROM (read only memory), storage, tablet device, technology, touchscreen, touchpad	
Programming: algorithm, animation, application, code, code block, coding application, debug, decompose, interface, game, loop, predict, program, repetition code, review, Scratch, sprite, tinker Scratch		
Video trailers	application, camera angle, clip, edit,film editing software, graphics, import, key events, photo, plan, recording, sound effects, storyboard, time code, trailer,transition, video, voiceover	

Unit	Key Vocabulary
	Y4
Collaborative	animations, average, bar chart, collaboration, comment, conditional formatting, contribution, data, edited, email account, format, freeze, icon,

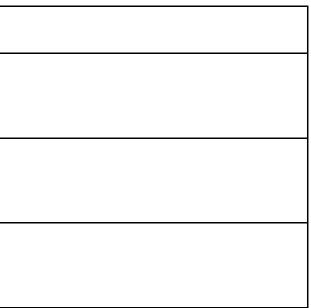
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Learning	images, insert, link, multiple choice, numerical data, pie chart, presentations, resolved, reviewing comments, share, slides, software, spreadsheets, suggestions, survey, teamwork, themes, transitions
Further Coding with Scratch	broadcast block, code blocks, conditional, coordinates, decomposition, features, game, information, negative numbers, orientation, parameters, position, program, project, script, sprite, stage, tinker, variables
HTML	code, component, content, copyright, CSS, end tag, fake news, hacking, heading, headline, hex code, HTML, input, internet browser, output, paragraph, permission, remixing, script, start tag,tags, text, URL, webpage
Computational Thinking	abstraction, algorithm, code, computational thinking, decomposition, input, logical reasoning, output, pattern recognition, script, sequence, variable

Unit	Key Vocabulary	
	Y5	
Search Engines	algorithm, appropriate, copyright, correct, credit, data leak, deceive, fair, fake, inappropriate, incorrect, index, information, keywords, network, privacy, rank, real, search engine, TASK, web crawler, website	
Online Safety	accurate information, advice, app permissions, application, apps, bullying, communication, emojis, health, in-app purchases, information, judgement, memes, mental health, mindfulness, mini-biography, online communication, opinion, organisation, password, personal information, positive contributions, private information, real world, strong password, summarise, support, technology, trusted adult, wellbeing	
Mars Rover	8-bit binary, addition, ASCII, binary code, boolean, byte, communicate, construction, CPU, data transmission, decimal numbers, design, discovery, distance, hexadecimal, input, instructions, internet, Mars Rover, moon, numerical data, output, planet, radio signal, RAM, research, scientist, sequence, signal, simulation, space, subtraction, technology, transmit	
Programming Music	beat, bugs, coding, command, debug, decompose, error, instructions, loop, melody, mindmap, music, output, performance, pitch, play, predict, programming, rhythm, tempo, timbre, tinker, tutorials, typing	



Unit	Key Vocabulary
	Y6
Big Data 1	algorithms, barcode, binary, Boolean, brand, chips, commuter, contactless, data, encrypted, infrared, MagicBand, privacy, proximity, QR code, QR scanner, radio waves, RFID, signal, systems/data analyst, transmission, wireless
Bletchley Park	acrostic code, brute force hacking, caesar cipher, chip and pin system, cipher, code, combination, contribute, convince, date shift cipher, discovery, hero, invention, Nth Letter Cipher, password, Pig Latin, Pigpen cipher, present, scrambled, secret, secure, technological advancement, trial and error
History of Computers	background noise, byte, computer, devices, file, FX, gigabyte, graphics, hard drive, hardware, kilobytes, megabyte, memory storage, mouse, operativ play, RAM, Raspberry Pi, record, reverb, ROM, script, smartphone, sound, sound effects, terabytes, touch screen, track, trackpad, trailer
Intro to Python	algorithm, code, command, design, import, indentation, input, instructions, loop, output, patterns, random, remix, repeat, shape

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ating system, overlay, play, processor, radio