Slade Primary School

Computing Knowledge Progression Map



Progression in Computing Knowledge	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Problem	Understand	Have a clear	Create an algorithm	Develop an	Create original	• Learn some of the
Solver	that a programmable toy can be controlled by inputting a sequence of instructions. • Develop and record sequences of instructions as an algorithm. • Program the toy to follow their algorithm. • Debug their programs. • Predict how their	understanding of algorithms as sequences of instructions. • Convert simple algorithms to programs. • Predict what a simple program will do. • Spot and fix (debug) errors in their programs. • Understand what algorithms	for an animated scene in the form of a storyboard. • Write a program in Scratch to create the animation. • Correct mistakes in their animation programs. • Design, write and debug programs that accomplish specific goals; solve problems by decomposing them into smaller parts. • Use sequence in programs; work with variables and various forms of input and output.	educational computer game using selection and repetition. • Understand and use variables. • Start to debug computer programs. • Recognise the importance of user interface design, including consideration of input and output. • Design, write and debug programs that accomplish specific goals. • Use sequence, selection, and repetition in programs; work with variables and various	 artwork and sound for a game. Design and create a computer program for a computer game, which uses sequence, selection, repetition and variables. Detect and correct errors in their computer game. Use iterative development techniques (making and testing a series of small changes) to improve their game. Design, write and debug programs that accomplish specific goals, including 	 syntax of a text-based programming language. Use commands to display text on screen, accept typed user input, store and retrieve data using variables and select from a list. Plan a text-based adventure with multiple 'rooms' and user interaction. Thoroughly debug the program. Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve
	programs will work.	are; how they are implemented	 Use logical reasoning to detect and correct 	forms of input and output.	controlling or simulating physical systems; solve problems by	problems by decomposing them into smaller parts.

Our Curriculum Intent:

	Understand	as programs	errors in algorithms and	Use logical reasoning	decomposing them into	• Use sequence,
	what	on digital	programs.	to explain how some	smaller parts.	selection and repetition
	algorithms	devices; and	 Select, use and 	simple algorithms work	• Use sequence,	in programs; work with
	are; how they	that programs	combine a variety of	and to detect and	selection, and repetition	variables and various
	are	execute by	software to design	correct errors in	in programs; work with	forms of input and
	implemented	following	and create content	algorithms and	variables and various	output.
	as programs	precise and	that accomplish(es)	programs.	forms of input and	Use logical reasoning
	on digital	unambiguous	given goals, including	programs.	output.	to explain how some
	devices; and	instructions.	presenting		Use logical reasoning	simple algorithms work
	that programs	 Create and 	information.		to explain how some	and to detect and
	execute by	debug simple	information.		simple algorithms work	correct errors in
	following	programs.			and to detect and	algorithms and
	precise and	 Use logical 			correct errors in	programs. Software:
	unambiguous	reasoning to			algorithms and	Python (using the IDLE
	instructions.	predict the			programs.	editor) or trinket.io
	Create and	behaviour of			 Select, use and 	Apps: Pythonista or
	debug simple	simple			combine a variety of	Python 3.4 for iOS (iOS),
	programs.	programs			software (including	SL4A (Android), or
	 Use logical 	programs			internet services) on a	trinket.io via Safari
	reasoning to				range of digital devices	
	predict the				to design and create a	
	behaviour of				range of programs,	
	simple				systems and content	
	programs.				that accomplish given	
	Recognise				goals.	
	common uses				goals.	
	of information					
	technology					
	beyond					
	school.					
Programmer	Break down	• Describe	• Develop a number of	• Design and make an	• Be familiar with	Develop the ability to
	a process into	carefully what	strategies for finding	on-screen prototype of a	semaphore and Morse	reason logically about
	simple, clear	happens in	errors in programs.		code.	algorithms.
				1	1	

steps, as in an	computer	• Build up resilience and	computer-controlled	Understand the need	Understand how some
algorithm.	games.	strategies for problem	toy.	for private information	key algorithms can be
• Use	 Use logical 	solving.	 Understand different 	to be encrypted.	expressed as programs.
different	reasoning to	 Increase their 	forms of input and	 Encrypt and decrypt 	Understand that some
features of a	make	knowledge and	output (such as sensors,	messages in simple	algorithms are more
video camera.	predictions of	understanding of	switches, motors, lights	ciphers.	efficient than others for
 Use a video 	what a	Scratch.	and speakers).	 Appreciate the need 	the same problem.
camera to	program will	 Recognise a number 	 Design, write and 	to use complex	 Understand common
capture	do.	of common types of bug	debug the control and	passwords and to keep	algorithms for sorting
moving	 Test these 	in software.	monitoring program for	them secure.	and searching.
images.	predictions.	 Debug programs that 	their toy.	 Have some 	 Appreciate algorithmic
 Develop 	Think	accomplish specific	 Design, write and 	understanding of how	approaches to problems
collaboration	critically	goals.	debug programs that	encryption works on the	in mathematics.
skills.	about	 Use sequence, 	accomplish specific	web.	 Design, write and
 Discuss their 	computer	selection, and repetition	goals, including	 Use logical reasoning 	debug programs that
work and	games and	in programs; work with	controlling or simulating	to explain how some	accomplish specific
think about	their use.	variables and various	physical systems.	simple algorithms work	goals.
how it could	 Be aware of 	forms of input and	 Use sequence, 	and to detect and	 Use sequence,
be improved.	how to use	output.	selection, and repetition	correct errors in	selection and repetition
 Understand 	games safely	 Use logical reasoning 	in programs; work with	algorithms and	in programs; work with
what	and in balance	to explain how some	various forms of input	programs.	variables and various
algorithms	with other	simple algorithms work	and output.	 Understand computer 	forms of input and
are; how they	activities.	and to detect and	 Use logical reasoning 	networks including the	output.
are	 Understand 	correct errors in	to explain how some	internet; how they can	 Use logical reasoning
implemented	what	algorithms and	simple algorithms work	provide multiple	to explain how some
as programs	algorithms	programs.	and to detect and	services, such as the	simple algorithms work
on digital	are; how they		correct errors in	world wide web; and the	and to detect and
devices; and	are		algorithms and	opportunities they offer	correct errors in
that programs	implemented		programs.	for communication and	algorithms and
execute by	as programs			collaboration.	programs.
following	on digital			• Use technology safely,	
precise and	devices; and			respectfully and	
	that programs			responsibly; recognise	

	unambiguous instructions. • Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Recognise common uses of information technology beyond school. • Use logical reasoning to predict the behaviour of simple	execute by following precise and unambiguous instructions. • Use logical reasoning to predict the behaviour of simple programs. • Recognise common uses of information technology beyond school. • Use technology safely and respectfully, keeping personal			acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	
	simple programs.					
Logical Thinker	 Use the web safely to find ideas for an illustration. Select and use appropriate painting tools 	 Consider the technical and artistic merits of photographs. Use a digital camera or camera app. 	 Gain skills in shooting live video, such as framing shots, holding the camera steady, and reviewing. Edit video, including adding narration and editing 	 Use one or more programs to edit music. Create and develop a musical composition, refining their ideas through reflection and discussion. 	 Develop an appreciation of the links between geometry and art. Become familiar with the tools and techniques of a vector graphics package. 	 Think critically about how video is used to promote a cause. Storyboard an effective advert for a cause. Work collaboratively to shoot suitable original

to create and	• Take digital	clips by setting in/out	Develop collaboration	Develop an	footage and source
change	photographs.	points.	skills.	understanding of turtle	additional content,
images on the	 Review and 	 Understand the 	• Develop an awareness	graphics.	acknowledging
computer.	reject or rate	qualities of effective	of how their	• Experiment with the	intellectual property
 Understand 	the images	video, such as the	composition can	tools available, refining	rights.
how this use	they take.	importance of narrative,	enhance work in other	and developing their	 Work collaboratively
of ICT differs	 Edit and 	consistency, perspective	media.	work as they apply their	to edit the assembled
from using	enhance their	and scene length.	• Use sequence,	own criteria to evaluate	content to make an
paint and	photographs.	 Select, use and 	selection, and repetition	it and receive feedback	effective advert.
paper.	 Select their 	combine a variety of	in programs; work with	from their peers.	 Use search
 Create an 	best images	software (including	variables and various	 Develop some 	technologies effectively,
illustration for	to include in a	internet services) on a	forms of input and	awareness of computer-	appreciate how results
a particular	shared	range of digital devices	output.	generated art, in	are selected and ranked,
purpose. •	portfolio.	to design and create a	 Understand computer 	particular fractal-based	and be discerning in
Know how to	Use	range of programs,	networks including the	landscapes.	evaluating digital
save, retrieve	technology	systems and content	internet; and the	 Use sequence, 	content.
and change	purposefully	that accomplish given	opportunities they offer	selection, and repetition	 Select, use and
their work.	to create,	goals, including	for communication and	in programs; work with	combine a variety of
 Reflect on 	organise,	collecting, analysing,	collaboration.	variables and various	software (including
their work and	store,	evaluating and	 Be discerning in 	forms of input and	internet services) on a
act on	manipulate	presenting data and	evaluating digital	output.	range of digital devices
feedback	and retrieve	information.	content.	 Use logical reasoning 	to design and create a
received.	digital	 Work with various 	 Select, use and 	to explain how some	range of programs,
• Use	content.	forms of input and	combine a variety of	simple algorithms work	systems and content
technology	 Recognise 	output.	software (including	and to detect and	that accomplish given
purposefully	common uses	 Use technology safely, 	internet services) on a	correct errors in	goals, including
to create,	of information	respectfully and	range of digital devices	algorithms and	collecting, analysing,
organise,	technology	responsibly	to design and create a	programs.	evaluating and
store,	beyond		range of programs,	 Select, use and 	presenting data and
manipulate	school.		systems and content	combine a variety of	information.
and retrieve	• Use		that accomplish given	software (including	 Use technology safely,
digital	technology		goals, including	internet services) on a	respectfully and
content.	safely and		collecting, analysing,	range of digital devices	responsibly; recognise

	• Recognise common uses of information	respectfully, keeping personal		evaluating and presenting data and information.	to design and create a range of programs, systems and content	acceptable/unacceptable behaviour; identify a range of ways to report
	technology beyond school. • Use	information private; identify where to go for help		• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable	that accomplish given goals, including collecting, analysing, evaluating and	concerns about content and contact.
	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	and support when they have concerns about content or contact on the internet or other online technologies		behaviour	presenting data and information	
	other online technologies.					
Content Creator	• Understand what algorithms are; how they are implemented as programs on digital devices; and	 Develop collaboration skills through working as part of a group. Develop research skills through 	 Understand some elements of survey design. Understand some ethical and legal aspects of online data collection. Use the web to facilitate data collection. 	 Understand different measurement techniques for weather, both analogue and digital. Use computer- based data logging to automate the recording of some weather data. 	 Understand the work of architects, designers and engineers working in 3D. Develop familiarity with a simple CAD (computer aided design) tool. 	 Manage or contribute to large collaborative projects, facilitated using online tools. Write and review content. Source digital media while demonstrating

that programs	searching for	 Gain skills in using 	Use spreadsheets to	Develop spatial	safe, respectful and
execute by	information	charts to analyse data.	create charts	awareness by exploring	responsible use.
following	on the	Gain skills in interpreting	 Analyse data, explore 	and experimenting with	 Design and produce a
precise and	internet.	results.	inconsistencies in data	a 3D virtual	high-quality print
' unambiguous	 Improve 	Select, use and combine	and make predictions •	environment.	document.
instructions.	note-taking	a variety of software	Practise using	 Develop greater 	 Understand computer
• Use	skills through	(including internet	presentation software	aesthetic awareness.	networks including the
technology	the use of	services) on a range of	and, optionally, video.	• Use search	internet and the
purposefully	mind	digital devices to design	Work with variables	technologies effectively,	opportunities they offer
to create,	mapping.	and create a range of	and various forms of	appreciate how results	for communication and
organise,	Develop	programs, systems and	input and output.	are selected and ranked,	collaboration.
store,	, presentation	content that accomplish	 Use logical reasoning 	and be discerning in	 Use search
manipulate	skills through	given goals, including	to explain how some	evaluating digital	technologies effectively,
and retrieve	creating and	collecting, analysing,	simple algorithms work.	content.	appreciate how results
digital	delivering a	evaluating and	• Use search	 Select, use and 	are selected and ranked,
content.	short	presenting data and	technologies effectively,	combine a variety of	and be discerning in
• Use	multimedia	information.	appreciate how results	software (including	evaluating digital
technology	presentation.	 Understand computer 	are selected and ranked,	internet services) on a	content.
safely and	• Use	networks, including the	and be discerning in	range of digital devices	 Select, use and
respectfully,	technology	internet; how they can	evaluating digital	to design and create a	combine a variety of
keeping	purposefully	provide multiple	content.	range of programs,	software (including
personal	to create,	services, such as the	 Select, use and 	systems and content	internet services) on a
information	organise,	world wide web; and the	combine a variety of	that accomplish given	range of digital devices
private;	store,	opportunities they offer	software (including	goals, including	to design and create a
identify where	manipulate	for communication and	internet services) on a	collecting, analysing,	range of programs,
to go for help	and retrieve	collaboration.	range of digital devices	evaluating and	systems and content
and support	digital		to design and create a	presenting data and	that accomplish given
when they	content.		range of programs,	information.	goals, including
have concerns	 Recognise 		systems and content		collecting, analysing,
about content	common uses		that accomplish given		evaluating and
or contact on	of information		goals, including		presenting data and
the internet or	technology		collecting, analysing,		information.
			evaluating and		

	other online	beyond		presenting data and		• Use technology safely,
	technologies.	school.		information.		respectfully and
	 Recognise 	• Use				responsibly.
	common uses	technology				
	of information	safely and				
	technology	respectfully,				
	beyond	keeping				
	school.	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				
Beyond	• Use sound	 Understand 	Use a search engine to	 Understand some 	 Develop their research 	Appreciate that
School	recording	that email can	learn about a new topic.	technical aspects of how	skills to decide what	computer networks
	equipment to	be used to	 Plan, design and 	the internet makes the	information is	transmit and receive
	record sounds.	communicate.	deliver an interesting	web possible.	appropriate.	information digitally. •
	• Develop	• Develop	and engaging	 Use HTML tags for 	Understand some	Understand the basic
	skills in saving	skills in	presentation.	elementary mark up. •	elements of how search	hardware needed for
	and storing	opening,	Search for and	Use hyperlinks to	engines select and rank	computer networks to
	sounds on the	composing	evaluate online images.	connect ideas and	results.	work.
	computer.	and sending	Create their own	sources.	Question the	Understand key
	Develop	emails.	original images.	Code up a simple web	plausibility and quality of	features of internet
	collaboration	• Gain skills in		page with useful	information.	communication
	skills as they	opening and		content.		protocols.

work together	listening to	Create a video	Understand some of	Develop and refine	Develop a basic
in a group. •	audio files on	slidecast of a narrated	the risks in using the	their ideas and text	understanding of how
Understand	the computer.	presentation.	web.	collaboratively.	domain names are
how a talking	• Use	• Develop	 Understand computer 	 Develop their 	converted to numerical
book differs	appropriate	understanding of how	networks including the	understanding of online	IP addresses.
from a paper-	language in	the internet, the web	internet; how they can	safety and responsible	 Understand computer
based book. •	emails. •	and search engines	provide multiple	use of technology.	networks including the
Talk about and	Develop skills	work.	services, such as the	 Understand computer 	internet; how they can
reflect on their	in editing and	 Understand computer 	world wide web; and the	networks including the	provide multiple
use of ICT.	formatting	networks, including the	opportunities they offer	internet; how they can	services, such as the
• Share	text in emails.	internet; how they can	for communication and	provide multiple	world wide web; and the
recordings	 Be aware of 	provide multiple	collaboration.	services, such as the	opportunities they offer
with an	online safety	services, such as the	 Use technology safely, 	world wide web; and the	for communication and
audience.	issues when	World Wide Web.	respectfully and	opportunities they offer	collaboration.
• Use	using email.	 Use search 	responsibly; know a	for communication and	 Use technology safely,
technology	• Use	technologies effectively,	range of ways to report	collaboration.	respectfully and
purposefully	technology	appreciate how results	concerns and	 Use search 	responsibly; recognise
to create,	purposefully	are selected and ranked,	unacceptable behaviour.	technologies effectively,	acceptable/unacceptable
organise,	to create,	and be discerning in	 Use and combine a 	appreciate how results	behaviour; identify a
store,	organise,	evaluating digital	variety of software	are selected and ranked,	range of ways to report
manipulate	store,	content.	(including internet	and be discerning in	concerns about content
and retrieve	manipulate	 Select, use and 	services) to accomplish	evaluating digital	and contact.
digital	and retrieve	combine a variety of	given goals, including	content.	
content.	digital	software (including	presenting information	 Select, use and 	
 Recognise 	content.	internet services) on a		combine a variety of	
common uses	 Recognise 	range of digital devices		software (including	
of information	common uses	to design and create a		internet services) on a	
technology	of information	range of content that		range of digital devices	
beyond	technology	accomplish given goals,		to design and create a	
school.	beyond	including collecting,		range of programs,	
• Use	school.	analysing, evaluating		systems and content	
technology	• Use	and presenting		that accomplish given	
	technology	information.		goals, including	

	safely and respectful.	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.	• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact		collecting, analysing, evaluating and presenting data and information. • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	
Online Safety	 Develop basic keyboard skills, through typing and formatting text. Develop basic mouse skills. Use the web to find and select images. Develop skills in storing 	 Sort and classify a group of items by answering questions. Collect data using tick charts or tally charts. Use simple charting software to produce pictograms 	Develop a basic understanding of how email works. • Gain skills in using email. • Be aware of broader issues surrounding email, including 'netiquette' and online safety. • Work collaboratively with a remote partner. • Experience video conferencing. • Understand computer networks, including the	 Understand the conventions for collaborative online work, particularly in wikis. Be aware of their responsibilities when editing other people's work. Become familiar with Wikipedia, including potential problems associated with its use. Practise research skills. 	 Become familiar with blogs as a medium and a genre of writing. Create a sequence of blog posts on a theme. Incorporate additional media. Comment on the posts of others. Develop a critical, reflective view of a range of media, including text. Understand computer networks including the internet; how they can 	 Research a location online using a range of resources appropriately. Understand the safe use of mobile technology, including GPS. Capture images, audio and video while on location. Showcase shared media content through a mapping layer. Understand computer networks, including the internet; how they can

and retrieving	and other	internet; how they can	Write for a target	provide multiple	provide multiple
files.	basic charts.	provide multiple	audience using a wiki	services, such as the	services, such as the
• Develop	 Take, edit 	services, such as the	tool.	world wide web; and the	world wide web; and the
skills in	and enhance	world wide web; and the	 Develop collaboration 	opportunities they offer	opportunities they offer
combining	photographs.	opportunities they offer	skills. • Develop	for communication and	for communication and
text and	Record	for communication and	proofreading skills.	collaboration.	collaboration. • Use
images.	information	collaboration.	 Solve problems by 	 Select, use and 	search technologies
• Discuss their	on a digital	 Select, use and 	decomposing them into	combine a variety of	effectively, appreciate
work and	map.	combine a variety of	smaller parts.	software (including	how results are selected
think about	• Use	software (including	 Understand computer 	internet services) on a	and ranked, and be
whether it	technology	internet services) on a	networks including the	range of digital devices	discerning in evaluating
could be	purposefully	range of digital devices	internet; how they can	to design and create a	digital content.
improved.	to create,	to design and create a	provide multiple	range of programs,	 Select, use and
Use	organise,	range of programs,	services, such as the	systems and content	combine a variety of
technology	store,	systems and content	world wide web; and the	that accomplish given	software (including
purposefully	manipulate	that accomplish given	opportunities they offer	goals, including	internet services) on a
to create,	and retrieve	goals, including	for communication and	collecting, analysing,	range of digital devices
organise,	digital	collecting, analysing,	collaboration.	evaluating and	to design and create a
store,	content.	evaluating and	 Use search 	presenting data and	range of programs,
manipulate	 Recognise 	presenting data and	technologies effectively.	information.	systems and content
and retrieve	common uses	information.	 Use a variety of 	 Use technology safely, 	that accomplish given
digital	of information	 Use technology safely, 	software (including	respectfully and	goals, including
content.	technology	respectfully and	internet services) to	responsibly; recognise	collecting, analysing,
 Recognise 	beyond	responsibly; recognise	create content	acceptable/unacceptable	evaluating and
common uses	school.	acceptable/unacceptable	including presenting	behaviour; identify a	presenting data and
of information	• Use	behaviour; identify a	information.	range of ways to report	information.
technology	technology	range of ways to report	 Use technology safely, 	concerns about content	 Use technology safely,
beyond	safely and	concerns about content	respectfully and	and contact.	respectfully and
school.	respectfully,	and contact	responsibly; recognise	 be discerning in 	responsibly; recognise
• Use	keeping		acceptable/unacceptable	evaluating digital	acceptable/unacceptable
technology	personal		behaviour; identify a	content.	behaviour; identify a
safely and	information		range of ways to report		range of ways to report
respectfully,	private;				

keeping	identify where	concerns about content	concerns about content
personal	to go for help	and contact.	and contact.
information	and support		
private;	when they		
identify where	have concerns		
to go for help	about content		
and support	or contact on		
when they	the internet		
have concerns	or other		
about content	online		
or contact on	technologies.		
the internet or			
other online			
technologies			