Computing Knowledge and Skills Progression

'As computer scientists, we develop our use of technology so we can programme, create and communicate with others responsibly.'

understand, create, develop, organise, analyse, apply

Computing Intent

Computing increasingly permeates through all areas of life; at the heart of this is the safety of pupils. We provide opportunities for pupils to engage with the necessary skills to work safely and effectively with technology. Learning opportunities will enable them to navigate the online world both inside and outside school and throughout their lives. Our lessons allow pupils to develop their critical thinking and analytical skills which they can transfer between a range of devices, software and situations. Pupils grow in resilience when working with coding to change, adapt and debug programmes to reach successful outcomes.

EYFS

At Pye Green, we recognise the fundamental role a child's early years has in shaping the person and learner they become. Our curriculum is designed to build upon the strong foundations set down in our Early Years Foundation Stage. Each curriculum subject takes note of its predecessors in the EYFS, building upon and making links with prior learning.

Computing

In EYFS, pupils have daily access to interactive screens where reading material is often shared with them. In Nursery, pupils also have access to iPads and programmable toys so that they can explore how they operate, make things happen and use technology to enhance their creativity. They access these through carefully planned continuous provision activities. In Reception, pupils access discrete computing lessons where they use a range of programmes and hand-picked websites to complete simple programs, express their creativity and aid their development in other areas of the curriculum as well as begin to learn about how to stay safe through the use of stories and discussions.

Development Matters

Literacy: Reading -
Children read and understand simple sentences. They use phonic knowledge to decode regular words and read them aloud accurately. They also read some common irregular words. They demonstrate understanding when talking with others about what they have read.

Understanding the World: Technology –
Children recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes.

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NC Computing Pupils should be taught to:		Y1	Y2
understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions create and debug simple programs use logical reasoning to predict the behaviour of simple programs	Skills	• Create clear verbal instructions for other people to follow (an algorithm) • Orally revise simple instructions when things do not go right • Use icons/blocks (arrows and turns) • Use trial and error to try to solve problems with algorithms	• Begin to use repeat/loop functions to make the same thing happen more than once • Create algorithms using block coding (arrows, turns, repeats + blue blocks in scratch) • Begin to identify what the error is in a pre-prepared script by working through instructions systematically • Begin to make predictions about what will happen when block code is started
	Vocabulary	algorithm, debug, step-by-step, process, sequence, predict, clips, edit	Drag and drop, repeat, input, script, block, motion, events, control, glide, go to, costume, resize, grow, shrink, aim, audience, outcome, playability, engaging
	How it is covered	Autumn 1 – Children use a programmable toy (real or on screen) to input simple instructions to get to a specific location. Autumn 2 - Video pretending to be TV chefs making a meal Spring 2 – Spring 2 – Search the internet, sort images based on binary questions and organise the images according to rules.	Autumn 1 – Following instructions to locate and link blocks to make something happen on screen Autumn 2 - Moving onscreen sprites to specific locations. (First use of Scratch.mit) Spring 1 – Testing Scratch games, identifying what is good and how they could be developed
use technology purposefully to create, organise, store, manipulate and retrieve digital content recognise common uses of information technology beyond school	Skills	• Develop hand-eye coordination to paint a picture • Save their work into a shared file on the server and open it again • Edit my own work • Talk about where technology is used beyond school • Add a voiceover to a book • Use keyboard skills to type a simple username	• Take a picture • Ensure the picture is clear without hands or other unwanted items • Crop images. • Insert images into a wider range of software (Moldiv/book creator) • Begin to learn how to send an email message. • Use keyboard skills to type a simple username and password into a given program
	Vocabulary	tools, toolbox, shapes, colours, picker tool, select, zoom, add sound, import, recording, pixels, handles, move, resize, search, enter, space, keys, mouse, keyboard, drag, drop, shift, caps lock, font, colour, size, print	Frame, stop-frame, animation, step-by-step, capture, ghost/overlay, frames per second, adjust, logon, password, inbox, sent, trash, send, discard, to,
	How it is covered	Autumn 2 - Video pretending to be TV chefs making a meal Spring 1 – Children will use Paint to create a picture from a traditional tale. Spring 2 – Search the internet, sort images based on binary questions and organise the images according to rules. Summer 1 - Children will add their own voices and sound effects to create an e-book Summer 2 - Combine images from the internet with words and phrases written by the children to create a card for a specific event	Spring 2 – Creating animations using 'Stop Frame' animation Summer 1 - Taking, editing, storing and using digital images Summer 2 – Sending emails to someone within the class
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.	Skills	• Develop hand-eye coordination to paint a picture • Save their work into a shared file on the server and open it again • Add a voiceover and sound effects to a story • Search the internet (guided) and discuss what to do if you find something that you don't like.	• Give respectful feedback to someone about their work • Learn about asking permission before taking and using someone's image • Consider the type of personal information that may be 'given away' by photographs • Learn what to do if you see something that you do not like on the internet or in email • Send emails which are safe and respectful, while keeping my personal data safe

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	Vocabulary	Personal information, private, share, concerned, worried	Frame, stop-frame, animation, step-by-step, capture, ghost/overlay, frames per second, adjust, logon, password, inbox, sent, trash, send, discard, to,
	How it is covered	Spring 1 – Children will use Paint to create a picture from a traditional tale. Spring 2 – Search the internet, sort images based on binary questions and organise the images according to rules. Summer 1 - Children will add their own voices and sound effects to create an e-book Summer 2 - Combine images from the internet with words and phrases written by the children to create a card for a specific event	Spring 2 – Creating animations using 'Stop Frame' animation Summer 1 - Taking, editing, storing and using digital images Summer 2 – Sending emails to someone within the class

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NC Computing Pupils should be taught to:		Y3	Y4	Y5	Y6
design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts use sequence, selection, and repetition in programs; work with variables and various forms of input and output use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	Skills	• Consider how repeat/loops can be used to create more efficient code • Begin to understand the conditional, *if* • Create my own character and background in scratch • Programme given code to *broadcast* between sprites • Begin to spot errors in script and start to debug them with some independence • Predict what will happen with given code • Check code and begin to use trial and improve to identify and solve errors	• Begin to understand a wider range of conditionals *if, else, until* • Write code in scratch for a range of inputs • Apply broadcasting between sprites to add sounds • Plan their own educational game • Add a second level to a game • Explore and create simple digital music • Check each step of code to identify errors.	• Consolidate my understanding of a wider range of conditionals *if, else, until* • Begin to create my own *function* blocks • Create a simulation/on-screen prototype that incorporates sensors (using conditionals) • Create a range of geometric art using selected shapes • Begin to work more systematically when identify errors in code before correcting them	• Create a range of variables • Create a counter using for • Create may own game incorporating random appearances and movements • Create digital music to go with this game • Systematically work through code to identify errors and correct them
	Vocabulary	Repeat, loops, efficient, conditional if, backdrop, broadcast, sprites, errors, debug, script	Conditional if, else, until inputs, stage, backdrop, repeat	Conditional if, else, until Function, simulation, prototype, systematic	Variables, counter, random, repeat, phrase, rhythm
	How it is covered	Autumn 1 – Children work through Code.org focusing on loops and being introduced to *if* function Autumn 2 – Children create a scripted animation with broadcasting of speech bubbles between the characters and movement (no inputs) Spring 1 – Children use pre-existing projects to identify errors and debug them	Autumn 1 – Children work through Code.org focusing on loops, nested loops and conditionals Autumn 2 – Children create a games where the object is to get past another sprite using a range of inputs Spring 1 – Children investigate a range of games and then create their own educational game Spring 2 – Children create simple electronic musing by sequencing instruments, repeating phrases etc.	Autumn 1 – Children work through Code.org focusing on conditionals and creating their own functions Spring – Children design a simple toy which incorporates sensor inputs and outputs. They then create an on-screen simulation/prototype	Autumn 2 – Children work through Code.org focusing on creating variables and *for loops* Spring – Children create a game with random movements and appearances. They also create the music and sounds which go with the game

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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	Skills	• Plan to produce a video • Use an iPad as a video camera • Create a range of scenes • Cut scenes together	• Work collaboratively using Office365, dividing labour accordingly • Add to a class Wiki about the Titanic • Check that what is posted is reliable • Understand how computers can be used to analyse data	• Work collaboratively using Office365, dividing labour accordingly • Create one document, shared by all contributors • Know how to create and share a document in Office365	• Create a website as part of a team • Insert internal links • Insert external links • Embed a video using embedding code
	Vocabulary	Capture, shot, frame a shot, background, foreground, shadow, edit, crop	Beat, rhythm, phrase, repeat, selection, sample, collaborate, share, edit, review, marker	collaborate, share, edit, review, marker	Page, embed, code, link, unlink, blog, media,
	How it is covered	Spring 2 – Children create a short narrated video of themselves practising a skill to use to help improve performance	Summer 1 - Children will create a class Wiki about the Titanic, using what they have learned in their wider curriculum work and further research Summer 2 - Children will create their own opinion poll, collect data and analyse the results	Summer 1 - Children analyse data about the weather (which they have collected in the Spring Term), create graphs and present the weather with their predictions	Summer 1 - Children create a media-rich blog Summer 2 – Children work collaboratively to create a website about cyber bullying/online safety
use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	Skills	• Search the internet for information • Begin to understand how we can narrow a search by using kids/KS2 to make the information more appropriate	• Begin to question if information is reliable and consider why there may be a difference in opinion	• Research specific dates and times of events • Pose increasingly targeted questions/use increasingly specific search terms to find out what they want to find out	• Begin to become sympathetic with what they find on the internet. They evaluate how useful the information will be when presenting their website and who the intended audience is • Begin to be discerning in evaluating digital content with relation to blogging
	Vocabulary	Search by keyword, search engine, browser, favourites, results, order, adverts			
	How it is covered	Summer 2 – Children search the internet for appropriate images to enhance their diary entry <u>Classwork</u> Autumn – Children search information from the internet about Skara Brae. Present the information using Comic Life Autumn – Children search information from the internet about hill forts. Present the information using Book Creator	<u>Classwork</u> Autumn – Children search information from the internet about The Romans. Present the information using Book Creator. Spring – Children research where inventions come from. This often brings up the question or reliability as some inventions appear to have been invented in different places according to different sources Summer – Children search large databases when looking at the Encyclopaedia Titanica to find out about staff and crew	Autumn 2 – Children research Robert Falcon Scott's expedition to the South Pole. Find appropriate images/video to insert into their iMovie media-rich video <u>Classwork</u> Autumn – Children research a range of factors linked to their wider curriculum including Shackleton, Scott and space exploration Spring – Children research the rainforest and the Ancient Maya Summer – Children research different types of Natural Disasters	Summer 2 – Children research cyber bullying and online safety <u>Classwork</u> Autumn – Children undertake research linked to WWI and then publish stories involving a range of text types Spring – Children research Everest and George Mallory Summer – Children research London and it's attractions

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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	Skills	• Create a word document • Find an appropriate image using the internet • Enhance/manipulate the image in paint • Insert the image into word and use picture tools to make it go where it needs to go. • Combine text and graphics in a range of software (Word, Comic Life, Book Creator)	• Create digital music • Experiment with different sounds • Work collaboratively using Office365, dividing labour accordingly • Add to a class Wiki about the Titanic • Check that what is posted is reliable • Combine text and graphics in a range of software (Word, Comic Life, Book Creator, Office 365 Wiki) • Understand what 'personal information' is • Consider the information that they need to ask people for to create an opinion poll	• Create a stop-frame animation • Import a range of content into iMovie • Sequence content appropriately • Input data into a spreadsheet and use it to create a range of graphs • Work collaboratively using Office365, dividing labour accordingly • Create one document, shared by all contributors • Know how to create and invite people to share a document in Office365 • Combine text and graphics in a range of software (Word, Comic Life, Book Creator, Office 365 PowerPoint, I Can Animate, iMovie) •	• Create repeating patterns using geometric art • Work collaboratively using Office365, dividing labour accordingly • Create one document, shared by all contributors • Know how to create and invite people to share a document in Office365 • Combine text and graphics in a range of software (Word, Comic Life, Book Creator, Office 365 PowerPoint, I Can Animate, iMovie, Green Screen) • Create a website as part of a team • Insert internal links • Insert external links • Embed a video
	Vocabulary	Search, cut, crop, insert, layout, alignment, position, text wrapping, callouts	Beat, rhythm, phrase, repeat, selection, sample, collaborate, share, edit, review, marker	Combine, frame, sequence, overlay, cell, data, chart, labels, axis, collaborate, share, edit, review, marker, vector, graphics, tessellation, turns, angles, edges	Page, embed, code, link, unlink, blog, media, green screen, source, chroma key, mask, pan, scale
	How it is covered	Summer 2 – Children search the internet for appropriate images to enhance their diary entry. Insert them into paint to edit and then put them into word to support their diary entry <u>Classwork</u> Autumn – Children search information from the internet about Skara Brae. Present the information using Comic Life Autumn – Children search information from the internet about hill forts. Present the information using Book Creator Spring – Children use Comic Life to create a poster about leading healthy lives Summer – Children use Book Creator to explain how to embalm a body	Spring 2 – Children create simple electronic music by sequencing instruments, repeating phrases etc. Summer 1 - Children will create a class Wiki about the Titanic, using what they have learned in their wider curriculum work and further research Summer 2 - Children will create their own opinion poll, collect data and analyse the results <u>Classwork</u> Autumn – Children search information from the internet about The Romans. Present the information using Book Creator. Spring – Children research where inventions come from. They download pictures and insert key information into pre-defined format, trying not to alter the overall dimensions This may need fonts and pictures to be manipulated	Autumn 2 – Children research Robert Falcon Scott's expedition to the South Pole. Find appropriate images/video to insert into their iMovie media-rich video Summer 1 - Children analyse data about the weather (which they have collected in the Spring Term), create graphs and present the weather with their predictions <u>Classwork</u> Autumn – Children research a range of factors linked to their wider curriculum including Shackleton, Scott and space exploration Spring – Children research the rainforest and the Ancient Maya Summer – Children research different types of Natural Disasters	Autumn 1 – Children use vector and turtle graphics to explore geometric art Summer 1 - Children create a media-rich blog Summer 2 – Children research cyber bullying and online safety <u>Classwork</u> Autumn – Children undertake research linked to WWI and then publish stories involving a range of text types Spring – Children research Everest and George Mallory Summer – Children research London and its attractions. Combine a map and I Can Animate to create an animated bus tour of London, which incorporates adverts. Summer – Present a Shakespeare play using Green Screen Summer – Use Comic Life to create a graphic novel of one of the Shakespeare plays

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use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	Skills	• Check with others that I am taking images of that they ae happy for me to do so and use • Use positive language and no negatives • Send and reply to emails in a safe, respectful and responsible manner • Be discerning about the emails they trust (and do not open the ones that they don't)	• Begin to understand what copyright is and how we can tell (watermarks and statements) • Discuss copyright of images, work and music • Only make positive comments on other people's work (positive, constructive feedback is very important and part of this • Use safe search and begin to understand the differences	• Understand that some messages need to be kept secret • Be able to create and crack codes using Caesar and substitution ciphers • Be able to generate strong passwords	• Understand what cyberbullying is and what to do if you feel that you or someone you know is being cyberbullied • Understand how to stay safe online. • Know how to report content or contact which they feel is unacceptable • Understand what is a negative/positive post on a blog • Understand what to do if they receive negative feedback
	Vocabulary	Capture, shot, frame a shot, background, foreground, shadow, edit, crop	Copyright, reliable, personal information, digital footprint, appropriate	Cipher, password, semaphore, substitution	• Cyberbullying, report, CEOP, content, contact
	How it is covered	• Spring 2 – Children create a short narrated video of themselves practising a skill to use to help improve performance • Summer 1 – Children compose and reply to emails to other members of the year group. This time they will add an attachment. Video conferencing is also taught.	• Spring 1 – Children investigate a range of games and then create their own educational game. Discuss 'comments' and how these may impact on the creator • Spring 2 – Children create simple electronic musing by sequencing instruments, repeating phrases etc. Discuss music copyright • Summer 1 - Children will create a class Wiki about the Titanic, using what they have learned in their wider curriculum work and further research. Discuss reliability of information	• Summer 2 - Children will experiment with sending messages across long distances. They will experiment with different ciphers to keep information secret before generating strong passwords <u>External visitors</u> PCSOs come into school at various points in the year to address issues and pass on key messages. This tends to reflect current events.	• Summer 2 – Children will create a website about cyberbullying and staying safe online to teach younger pupils <u>Classwork</u> Looking at age ratings for different website and ages. Discussion about PEGI ratings and why sites have age restrictions. Also look at what happens to their data once it is in the public domain <u>External visitors</u> PCSOs come into school at various points in the year to address issues and pass on key messages. This tends to reflect current events.

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Scratch progression

Year 2	Year 3	Year 4	Year 5	Year 6
Create own backdrop – check that backdrop has been selected and not sprite. Import sprites Grow/shrink sprites Drag/position sprites Motion blocks (blue) – know how to change speed of sprite Events (brown) - closed top – 'when green flag is clicked' Control (yellow) – 'wait' command Sound (pink) – experiment with library of sounds MOST IMPORTANT SKILL: Sprite must be positioned before 'go to' or 'glide' blocks are added to programming. This automatically sorts coordinates. This basic skill is continually used in animation/games throughout school.	Year 2 + Broadcasting Flip sprites (position) Say blocks Costume change Backdrop change Timing Sprite/Backdrop/Sound libraries Sounds If command Sensing Arrow key programming Understanding change blocks x/y negatives Show/Hide Accuracy with motion blocks De-bug Understand algorithm Storyboard	Y2/3 + Variables If/else Operators Join block Extra motion blocks Follow flowchart to assist programming	As Y4 + introduction of coding using Sphero to complete challenges/create a given outcome. Explore use of costumes	

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Software Map

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Ipad App	• Beebot App • Beebot Pyramid • ALEX • Daisy the Dino	• I can animate – stop frame animation - Claymation - Cut out animation • Puppet Pals • Use of camera •	• Comic Life • Book Creator	• Green Screen • Sphero	• Green Screen • iMovie • Book Creator • I Can Animate	• Green Screen • iMovie • Book Creator • I Can Animate
Microsoft	• Word	• Word • Powerpoint	•	•		•
Other	•	•	•	• 2 Simple Music Toolkit • Sphero - driving	• Sphero – programming????	• Soundation