Computing Progression Ladder
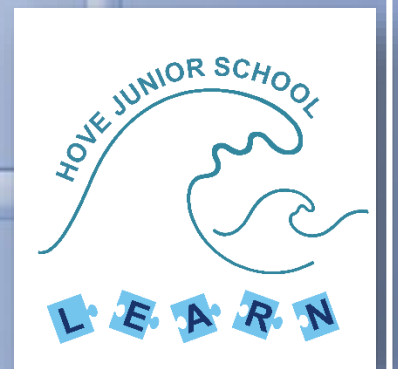
	Year R (Computing)		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Nursery	**Reception**						
Programming	**By the end of Reception:** There are Computing ELG or statements in the EYFS however the computing we teach in school is supporting children in other areas of the EYFS and providing skills to access an increasingly digital world.		**By the end of Year 2:** Children understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions. They create, debug and use logical reasoning to predict the behaviour of simple programs.		**By the end of Year 4, children:** Children design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; they solve problems by decomposing them into smaller parts. They use sequence, selection, and repetition in programs and work with variables and various forms of input and output. They use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. *Children build on their programming skills by solving problems and programming commands to achieve a specific outcome. They begin to write programs, explain algorithms and identify errors in their work.*		**By the end of Year 6, children:** Children design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; they solve problems by decomposing them into smaller parts. They use sequence, selection, and repetition in programs and work with variables and various forms of input and output. They use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. *Children build on their programming skills by using new systems such as a flowchart. They continue to break down problems and create algorithms to solve them. They are able to explain the outcome of an algorithm with confidence and accuracy.*	
	Copy the actions of others to operate simple equipment and toys	*Help adults operate equipment around the school, independently operating simple equipment*	*Physically follow & give each other instructions to move around*	*Physically follow and give each other forward, backward & turn (right-angle) instructions*	*Create and debug an algorithm using the move, rotate and repeat commands.*	*Develop an educational computer game using selection and repetition*	*Design and program a character game.*	*Investigate and evaluate the features of programming software.*
	Explore simple software to make things happen	*Use simple software to make things happen*	*Explore outcomes when buttons are pressed in sequences on a robot*	Articulate an algorithm to achieve a purpose	*Create and debug algorithms using penup and pendown.*	*Analyse educational games*	*Design an original character or backdrop for a game.*	*Program Kodu using 'When' and 'Do' instructions.*
	Use buttons on electronic toys and be able to state what the buttons do.	*Press buttons on a floor robot or screen robot and talk about the movements*	*Begin to use software to create movement & patterns on a screen*	Plan and enter a sequence of instructions to achieve an algorithm, *with a robot specifying distance & turn and drawing a trail*	*Create and debug algorithms that draw regular polygons, shapes and patterns in different applications (Scratch and Turtle Logo)*	*Start to debug computer programs (when creating games)*	*I can add features or effects to enhance a game (sounds and movement)*	*Use tools and add features to create an original landscape in Kodu.*
	Identify some differences between a variety of toys.	*Explore options and make choices with toys, software and websites*	Begin to identify an algorithm to achieve a specific purpose	*Explore outcomes when giving instructions in a simple Scratch program*		*Recognise the importance of user interface design, including consideration of input and output.*	*Create an original animated game with a specific goal.*	*Analyse and deconstruct code to work out its purpose.*
			Execute a program on a floor robot to achieve an algorithm	*Watch a simple Scratch program execute & debug any problems*		*Understand and use variables*	*Program costume changes for a sprite.*	*Program a character to be controlled around a custom track to reach a goal.*
			Use the word debug to correct any mistakes when programming a floor robot				*Add point-scoring and levels to game code.*	*Program a character to follow an automatic path.*
			Begin to predict what will happen for a short sequence of instructions in a program	*Predict what will happen & test results*				
				Talk about similarities & differences between floor robots and Scratch on screen				
Vocabulary	Press, What happens? Show me.	Choice, program, buttons, up, down, forward, backwards, turn.	Algorithm, debug, instructions, predict, movement,	Commands, debug, programming, sequence, algorithm.	*decompose, decomposing, logical sequence, flowchart, sprite, block, command, algorithm, answer, correct, errors, program, algorithm, instructions, commands, forward (fd), left (lt), right (rt), move, turn, clear screen (cs), variable.*		*flowchart, algorithm, control, output, symbol, start, stop, delay, process, decision, loop, backdrop, script, block, repeat, commentary, sequence, consequence, debug, program, Kodu, world, object, tool palette, program environment, smooth, flatten, raise*	
Digital literacy	**By the end of Reception:**		**By the end of KS1:**		**By the end of Year 4, children:**		**By the end of Year 6, children:**	

There are Computing ELG or statements in the EYFS however the computing we teach in school is supporting children in other areas of the EYFS and providing skills to access an increasingly digital world.		Children use technology purposefully to create, organise, store, manipulate and retrieve digital content.		Children 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. They 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.		Children 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.	
Mark make with a touch controlled device.	Use mouse control and simple software to create pictures	Create sounds and simple music phrases using ICT tools	Use an increasing variety of tools and effects in paint programs and talk about their choices	Google Forms – combining a variety of software	Describe early forms of animation before computers and how computers have made a difference.	Insert audio and video into a website.	Use appropriate software and other tools effectively to write a film script.
Explore images both physical and digital and identify if they are interactive or not. E.g. when you press on the balloon it starts the makes a noise.	Recognise text, images and sound when using ICT	Use a video or stills camera to record an activity	Explore the effects of sound and music in animation and video	Create slide templates and organise slides with hyperlinks.	Create a short computer animation using one or more moving stick figures.	Develop consistency of style and presentation, agreeing what to do about proofreading changes, adding content to pages created by others, and making substantive changes to others' content.	Locate and check appropriate digital content, and provide accurate crediting of sources.
Identify devices that allow you to take pictures or capture videos.	Use a camera or sound recorder to collect photos or sound	Record their own voices and play back to an audience	Copy and Paste images and videos from online resources.	Add theme, transitions and animation to a presentation.	Create a recorded animation involving a number of moving characters on a background.	Insert a hyperlink to other websites within A web page. stressing the importance of citing the sources of information they use.	Use digital recording devices to film and import into video editing software.
Move physical objects around in a small world scenario and describe to others the purpose of the movement. E.g. He's eating his dinner.	Use a mouse to rearrange objects and pictures on a screen	Add text and images to a template document using an image & word bank	Create own documents, adding text and images	Use action settings within a slide presentation (inserting hyperlinks).	Structure specific timing of animations using a time slider.	Embed images and media from other websites on a web page, again recognising the importance of citing sources.	Plan, conduct and import video interviews as part of a short film.
Understand that text on devices or toys is there to aid understanding. Identify text and images as separate things. E.g. that's my name and that is a dog.	Begin to use a keyboard to build words.	Use index fingers (left and right hand) on a keyboard to build words & sentences. Know when & how to use the SPACE BAR (thumbs) to make spaces between words	Use keyboard to enter text (index fingers left & right hand). Know when and how to use the RETURN/ ENTER key. Use SHIFT & CAPS LOCK to enter capital letters. Use DELETE & BACKSPACE buttons to correct text. Create sentences, SAVE & edit later	Insert audio and video into a slides presentation.	Use a camera to create a short stop motion animation film.		Use video editing software to create a short film.
Enjoy exploring age appropriate applications.	Develop an interest in ICT by using age appropriate websites or programs				Analyse and evaluate software.		Use software to create my own sounds by recording, editing and playing.
Know that devices have different things on them. e.g. Mummy has that game on her phone but Daddy doesn't.	Understand that work can be saved for later use.	Save and retrieve work from a folder the adult has designated.	Save work with a name that aids retrieval. Access the correct place to retrieve their own work.		Format images for a purpose.		Combine audio effects to create an original radio jingle.
Be able to tell if a device is on or off.	Know the computer requires a password. Know not to press the power button to turn off a computer.	Log on to the computer	Log on and Shut down correctly.		Use formatting tools to create an effective layout.		Research and plan digital content for a radio podcast.
					Use the spellcheck tool.		Use software to create and present digital content for a radio podcast.
					Insert and format a table in a word processing		

						document.		
						Change a page layout for a purpose.		
						Create hyperlinks within a word document.		

| Vocabulary | Game, picture, writing, button, press | Move, screen, click, drag, mouse, button, tools | paint, colour, brush, undo, redo, text, image, size, , window, size, close, log on, log off, keyboards, keys, double click, drag, save, open | launch, application, minimise, poster, restore, settings, software, present, save, retrieve, folder, name. | *Text and images: draw, object, shape, line, line colour, fill colour, group, ungroup, font, size, text box, format, image, wrap text, plan, link, image, object, link, hyperlink, minimise, restore, size, move, screen, split, create, organise, file, folder, close, exit, search, print, password, screenshot, snipping tool, shift, undo, redo, menu, dictionary, highlight, cursor, toolbar, spellcheck.*

Sound and motion: audio, sound, video, movie, embed, link, file format, animate, animation, still image, thaumatrope, zoetrope, zoopraxiscope, stereoscope, flip book, frame, onion skinning, loop, frame rate, record, stop, play, stop motion, stop frame. | *Text and images: window, layout, text, font, colour, format, heading, hyperlink, 2D shape, 3D shape, orbit, pan, zoom, eraser, dimension, measurement, guide.*

Sound and motion: audio, record, edit, play stop, skip, waveform, input, output, record, edit, play podcast, digital content, downloadable, backing track, voiceover, mute, gain, production, post-production, documentary, project, evaluation, screening, ceremony, upload. |

Handling Data	**By the end of Reception:** There are Computing ELG or statements in the EYFS however the computing we teach in school is supporting children in other areas of the EYFS and providing skills to access an increasingly digital world.		**By the end of KS1:** Children use technology purposefully to create, organise, store, manipulate and retrieve digital content.		***By the end of Year 4, children:*** *KS2 Computing National Curriculum Children 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.* *Children begin to explore expressing information in tables, sorting and organising information for others to be able to understand.*		***By the end of Year 6, children:*** *Children 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.* *Data Handling in UKS2 focuses on selecting the correct method to display data and using software such as spreadsheets. Children also learn how to check the accuracy of data and compare data for a specific purpose.*
	Look at pictures and describe what they show.	*Collect information as photos or sound files*	*Take photographs, video and record sound to record learning experiences*	*Take and save photographs, video & record sound to capture learning*	*Conduct a questionnaire using Google Forms.*	*Use computer-based data logging to automate the recording of some weather data.*		*Enter data and formulae into a spreadsheet.*
	Sort pictures using a simple difference e.g. food not food.	*Use a simple pictogram or set of photos to count and organise information*	*Look at how data is representing digitally*	*Ask questions and consider how they will collect information*		*Analyse data, explore inconsistencies in data and make predictions.*		*Order and present data based on calculations.*
	Put similar things in the same group. Say what is similar.	*Identify and Count how many things meet a criteria. E.g. how many little blue bears do we have?*	*Contribute to and interpret a pictogram*	*Collect data, generate graphs and charts to find answers*		*Use spreadsheets to create charts and graphs.*		*Add, edit and calculate data.*
	Interpret simple data from a picture. E.g. They have brown hair because I can see their photo.	*Look at and begin to interpret data that others have shared.*	*Save data for others to view.*	*Save & retrieve the data to show to others*				*Use a spreadsheet to solve problems.*
	I know that pictures can be used to represent information. E.g. A bear on the cover of the book tells me the book is about bears.	*I can identify a graph or pictogram when looking in a book or online.*	*I can recognize how pictograms can be used in real life.*	*I can recognise some ways that databases can be used in everyday life*				*Design a spreadsheet for a specific purpose.*

| Vocabulary | Pictures, sort | Photo, information, shared | Pictogram, graph, photographs, video. | Save, retrieve, data, questioning, | *Google forms, Google Sheets, insert, table, spreadsheet, cell, highlight, meteorologist, graph, import, generate, formula, Excel, PowerPoint* | | | *Google Docs, insert, row, column, calculate, format, edit, insert, ascending, descending.* |

| | **By the end of Reception:** | | **By the end of KS1:** | | **By the end of Year 4, children:** | | **By the end of Year 6, children:** | |

	There are Computing ELG or statements in the EYFS however the computing we teach in school is supporting children in other areas of the EYFS and providing skills to access an increasingly digital world.		Children recognise common uses of technology beyond school. They use technology safely and respectfully, keeping personal information private.		Children 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. They use search technologies effectively, appreciate how results are selected and ranked, and are discerning in evaluating digital content. Children refer to online safety rules when discussing technology in their lives. They are able to navigate between websites and use safe search terms on trusted search engines. They become more confident in using email for communication, including attaching and saving files from emails.		Children 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. They use search technologies effectively, appreciate how results are selected and ranked, and are discerning in evaluating digital content. Children can use safe search terms on trusted search engines, and evaluate websites based on layout and information. They become more confident in understanding Google rankings, adverts and the reliability of websites.	
Technology in Our Lives	*Recognise some of the outcomes of technology in the home and Nursery e.g. The camera can take pictures. That toy plays music.*	*Recognise purposes for using technology in school and at home*	*Recognise uses of technology in their homes and in their community*	*Recognise that some data is stored on a device and some is stored in online and can be accessed by many others. Begin to understand there are a variety of sources of information and begin to recognise the differences*	*Identify how word order affects search results.*	*Understand the term 'plagiarism' and how to avoid it.*	*Write citations for the websites used in research.*	*Identify secure websites by identifying privacy seals of approval.*
	Understand that some objects belong to different people and that you may need their permission to use them.	*Understand that things they create belong to them and can be shared with others using technology*	*Understand that there are online tools that can help them create and communicate*	*I can recognise some ways that online information can be used in everyday life. Begin to understand what the Internet is and the purposes that it is used for*	*Explain how searches return results.*		*Understand the work of architects, designers and engineers working in 3D*	*Understand the benefits and pitfalls of online relationships.*
	Recognise that interactive toys can help us play and learn.	*Recognise that they can use the Internet to play and learn*	*Recognise that some content on websites is not suitable for all ages.*	*Understand the different types of content on websites and that some things may not be true or accurate*	*Identify the ways, and investigate how, we communicate online.*		*Understand some elements of how search engines select and rank results.*	*Identify how the media play a powerful role in shaping ideas about girls and boys.*
					Explain how to stay safe and be responsible when communicating online.		*Question the plausibility and quality of information.*	
							Develop their understanding of the responsible use of technology.	
							Be familiar with semaphore and Morse code.	
							Encrypt and decrypt messages in simple ciphers.	
					World wide web, search, search engine, advanced search, results, Google, browser, terms of use, bias, authority, citation, plagiarism, source, website, secure, https, site, domain, website, browser, address bar.		*Have some understanding of how encryption works on the web.*	
Vocabulary	learn	Internet, computer, online,	Website, connected, sharing data	Access, shared, purpose, technology	*Filter, Google, search engine, image, keyboard, email, subject, address, communicate, sender, safe, secure,*			

	By the end of Reception: There are Computing ELG or statements in the EYFS however the computing we teach in school is supporting children in other areas of the EYFS and providing skills to access an increasingly digital world.		By the end of KS1: Children can use technology safely and respectfully, keeping personal information private; they identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.		By the end of Year 4, children: Children use technology safely, respectfully and responsibly. They recognise acceptable/unacceptable behaviour and identify a range of ways to report concerns about content and contact. Children become more aware of their digital footprint by reflecting on their experience on the internet. They are able to understand more about age-appropriate websites and adverts and how adverts are used by companies. Children are also introduced to the concept of plagiarism and citation. *internet, world wide web, social media.*		By the end of Year 6, children: Children use technology safely, respectfully and responsibly. They recognise acceptable/unacceptable behaviour and identify a range of ways to report concerns about content and contact. Children are encouraged to identify online risks and share their knowledge of the risks and consequences for people online. They begin to think more critically about what they see online and look at the concept of fake news and false photographs.	
Online Safety	Talk about some of the rules at home or nursery that are used to keep them safe.	Talk about good & bad choices in real life e.g. taking turns, saying kind things, helping others, telling an adult if something upsets you	Understand they need to follow certain rules to remain safe when visiting places online	Stay safe online by choosing websites that are good for them to visit & not inappropriate sites	Know what cyberbullying is and how to address it.	Define cyberbullying;	Understand the need for private information to be encrypted.	Say how people should deal with cyberbullying;
	Talk about how some actions are more risky than others. E.g. standing on a table.	Play appropriate games on the Internet	Begin to understand that if you create something you own it	Explore what cyber-bullying means & what to do when they encounter it	To understand how websites use advertisements to promote products.	Know how to respond to a hurtful message or comment online;	Appreciate the need to use complex Passwords, rules to create them and to keep them secure.	Identify warning signs that a website might not be secure (looking in the address bar).
	Talk about good and bad choices when playing with others – being kind, telling a grown up if something upsets us & keeping ourselves safe by keeping personal information private from strangers.	Talk about good and bad choices when using websites – being kind, telling a grown up if something upsets us & keeping ourselves safe by keeping information private	Learn that many websites ask for information that is private & discuss how to responsibly handle such requests	Know that if they put information online it leaves a digital footprint or "trail" & they need to manage it so it's not hurtful	Create strong passwords and understand privacy settings.	Access a trusted search engine; • understand that different search terms give different results;	Identify and explain what to do with spam email.	Explain what to do if I am asked or told something online which makes me uncomfortable.
	Know that people communicate with others to help each other. E.g. I told my sister I am hungry and she got me an apple.	Know that computers can share information with others.	Explore how computers can be used to share information with real people within their schools, families & communities	Understand that keyword searching is an effective way to locate online information & how to select keywords to produce the best search results	Safely send and receive emails, recognising when it is safe to open an email.	Know what plagiarism is;	Understand why they should cite a source.	Explain some of the dangers of revealing personal information to an online friend.
	Identify that some things are true and some things are made up.	Know that people sometimes say something that they think is true but it isn't.	Know that people all know different things and identify who might be the best person to ask to get the most accurate answer.	Discuss criteria for rating informational websites	Recognise different ways children can communicate Online and comparing this to communicating in the real world.	Identify which information to keep private online;	Know that not everything they see online is true;	Understand how a stereotype (including gender stereotypes) can be harmful.
	Know that some objects are not appropriate for children their age to use/have.	Know that some things online are not appropriate for their age.	Know that digital content often has age ratings and these are important to keep children safe.	Realise that not all websites are equally good sources of information		Explain what digital citizenship is.	Identify unsafe online behaviour.	Explain why cyberbullying can be as harmful as in-person bullying.
	Identify appropriate adults that they can tell if they are upset or scared.	Identify appropriate adults that they can talk to if they are concerned about online contact or content.	Understand the types of content or contact that may be of concern and know to report this to a sensible adult.	To understand that individuals or websites can be blocked from use and that reporting disturbing content is important to keep themselves and others safe.		Tell someone else at least one way to stay safe online.		
Vocabulary	Safe, real, not real.	Online safety, true, false, age appropriate, choice	Private, age rating, safety, accurate, communicate	Blocked, reporting, rating, keywords, searching.	safe, meet, accept, reliable, tell, online, trusted, adult, information, safety, personal, internet, world wide web, communicate, message, social media, email, password, cyberbullying/bullying, plagiarism, profiles, account, private, public.		spam, link, privacy, virus, scam, phishing, inbox, junk, sender, subject, secure, safe, account, online, private, social media, adverts, cyberbullying, reporting, anonymous, victim, fraud/fraudulent, policy, private/personal.	