Computing at St Ives Primary – Skills Progression

	COMPUTING SYSTEMS & NETWORKS	CREATING MEDIA	DATA & INFORMATION	PROGRAMMING	E-SAFETY
NURSERY	**Technology around us** To begin to understand that there are different types of technology. To learn to operate some forms of technology. To learn how to select an app on an iPad.	**Digital photos** To begin to understand that information technology can be used to record real life. **Digital painting** To use a device to create digital art.	**Grouping data** To understand that objects can be sorted into a group.	**Following instructions** To understand that instructions can result in actions.	Begin to understand ways in which information can be put online and how devices can be used to communicate with others. Begin to recognise negative behaviour online and it's impact. Begin to identify the different technologies that can be used to access the Internet.
YEAR R	**Technology around us** To understand that there are different types of technology. Understand that information technology can be used to communicate through text, images and sound. Understand that computers and other devices can be used to record and play back sounds. To learn what a mouse is and to develop basic mouse skills such as moving and clicking. To understand that a keyboard can be used to generate text on a computer and how to locate relevant keys.	**Digital painting** To use a simple online paint tool to create digital art. To add text to digital art. To understand that created media can be printed from a computer.	**Grouping data** To understand that information can be collected both practically and by using a computer program To sort objects into groups	**Moving a robot** To understand that some devices need commands to operate and control them (e.g. traffic lights, car park barrier, games console) To understand that technology can be programmed to move. To control a Beebot using the command buttons.	To understand emotions and respond to scenarios that make them feel uncomfortable online. To identify the different technologies that can be used to access the Internet and how to stay safe and healthy. To understand the importance of labelling their work.
YEAR 1	<u>Technology around us</u> To identify technology. **I can locate examples of technology in the classroom.** To identify a computer and its main parts **I can name the main parts of a computer.** To use a mouse in different ways. **I can use a mouse to create a picture.** To use a keyboard to type on a computer **I can type my name using a keyboard.** To use the keyboard to edit text. **I can delete letters.** To create rules for using technology responsibly. **I can identify rules to keep us safe and healthy when we are using technology in and beyond the home.**	**Digital painting** To describe what different freehand tools do. **To make careful choices when painting a digital picture.** To use the shape tool and the line tools **I can make marks with the shape and line tools.** To make careful choices when painting a digital picture **I can make appropriate colour and shape choices.** To explain why I chose the tools I used **I can choose appropriate paint tools and colours to recreate the work of an artist.** To use a computer on my own to paint a picture **I can use dots of colour to create a picture in the style of an artist on my own.** To compare painting a picture on a computer and on paper **I can say whether I prefer painting using computer/paper.** <u>Digital writing</u> To use a computer to write **I can identify and find keys on a keyboard.** To add and remove text on a computer **I can enter text into a computer and use the backspace key.** To identify that the look of text can be changed on a computer **I can type capital letters.** To make careful choices when changing text **I can change the font before and after.** To explain why I used the tools that I chose **I can decide if my changes have improved my writing.** To compare writing on a computer with writing on paper **I can identify the difference between typing and writing.**	<u>Grouping data</u> To label objects. **I can match objects to a group.** To identify that objects can be counted. **I can count a group of objects.** To describe objects in different ways. **I can find objects with similar properties.** To count objects with the same properties. **I can group similar objects.** To compare groups of objects. **I can describe groups of objects & properties.** To answer questions about groups of objects. **I can compare groups of objects.**	<u>Moving a robot</u> To explain what a given command will do. **I can match a command to an outcome.** To act out a given word. **I can give directions.** To combine forwards and backwards commands to make a sequence. **I can start a sequence from the same place.** To combine four direction commands to make sequences. **I can experiment with 'turn' & 'move' commands to move a robot.** To plan a simple program. **I can identify what my program should do.** To find more than one solution to a problem. **I can identify several possible solutions.** <u>Introduction to animation</u> To choose a command for a given purpose. **I can find commands to move a Sprite.** To show that a series of commands can be joined together. **I can use a *start* block in a program.** To identify the effect of changing a value. **I can find blocks that have numbers.** To explain that each sprite has its own instructions. **I can show that a project can include more than one Sprite.** To design the parts of a project. **I can decide how each Sprite will move.** To use my algorithm to create a program. **I can add programming blocks based on my algorithm.**	Keep themselves safe while using digital technology. Understand that information on the internet can be seen by others. The child can understand what to do if they see disturbing content online at home or at school.
YEAR 2	<u>Information technology around us</u> To recognise the uses and features of information technology. **I can describe some uses of computers.** To identify information technology in the school. **I can identify that some IT can be used in more than one way.** To identify information technology beyond school. **I can talk about uses of information technology.** To explain how information technology benefits us. **I can say why we use IT.** To show how to use information technology safely. **I can say how rules can help keep me safe.** To recognise that choices are made when using information technology. **I can used IT for different types of activities.**	**Digital photography** To know what devices can be used to take photographs. **I can recognize what devices can be used to take photographs.** To use a digital device to take a photograph. **I can explain why a photo looks better in portrait or landscape format.** To describe what makes a good photograph. **I can improve a photograph by retaking it.** To decide how photographs can be improved. **I can explore the effect that light has on a photo.** To use tools to change an image. **I can use a tool to achieve a desired effect.** To recognise that photos can be changed. **I can identify which photos are real and which have been changed.** **Making music** To say how music can make us feel. **I can say what I do and don't like about a piece of music.** To identify that there are patterns in music. **I can create and play an instrument following a rhythm pattern.** To describe how music can be used in different ways. **I can use a computer to experiment with pitch.** To show how music is made from a series of notes. **I can refine my musical pattern on a computer.** To create music for a purpose. **I can create my animal's rhythm on a computer.** To review and refine our computer work. **I can explain how I changed my work.**	**Pictograms** To recognise that we can count and compare objects using tally charts. **I can record and compare totals in a tally chart.** To recognise that objects can be represented as pictures. **I can use pictograms to answer simple questions about objects.** To create a pictogram. **I can use a tally chart to create a pictogram.** To select objects by attribute and make comparisons. **I can answer 'more than/less than' and 'most/least' questions about an attribute.** To recognise that people can be described by attributes. **I can create a pictogram and draw conclusions from it.** To explain that we can present information using a computer. **I can use a computer program to present information in different ways.**	**Robot algorithms** To describe a series of instructions as a sequence. **I can give and follow clear instructions.** To explain what happens when we change the order of instructions. **I can use an algorithm to program a sequence on a floor robot.** To use logical reasoning to predict the outcome of a program (series of commands). **I can compare my prediction to the program outcome.** To explain that programming projects can have code and artwork. **I can test my mat to make sure that it is usable.** To design an algorithm. **I can create an algorithm to meet my goal.** To create and debug a program that I have written. **I can test and debug each part of the program.** **Introduction to quizzes** To explain that a sequence of commands has a start. **I can identify the start of a sequence.** To explain that a sequence of commands has an outcome. **I can predict the outcome of a sequence of commands.** To create a program using a given design. **I can work out the actions of a sprite in an algorithm.** To change a given design. **I can choose backgrounds and characters for the design.** To create a program using my own design. **I can build sequences of blocks to match my design.** To decide how my project can be improved. **I can compare my project to my design.**	Keep themselves safe and show respect to others while using digital technology. Understand that they should not share personal information online. The child can understand what to do if they have concerns about content or contact online.
YEAR 3	<u>Connecting computers</u> To explain how digital devices function. **I can understand that digital devices accept inputs and produce outputs.** To identify input and output devices. **I can describe a simple process.** To recognise how digital devices can change the way we work. **I can explain how I use digital devices for different activities.** To explain how a computer network can be used to share information. **I can recognize different connections.**	<u>Stop-frame animation</u> To explain that animation is a sequence of drawings or photographs. **I can create an effective flip-book style animation.** To relate animated movement with a sequence of images. **I can predict what an animation that is achievable on screen.** To plan an animation. **I can describe an animation that is achievable on screen.** To identify the need to work consistently and	<u>Branching databases</u> To create questions with yes/no answers. **I can make a yes/no question about a collection of objects.** To identify the object attributes needed to collect relevant data. **I can select an attribute to separate objects into groups.** To create a branching database. **I can group objects using my own yes/no questions.** To explain why it is helpful for a database to be well structured.	<u>Sequence in music</u> To explore a new programming environment **I can recognise that commands in Scratch are represented as blocks..** To identify that commands have an outcome. **I can identify that each sprite is controlled by the commands I choose.** To explain that a program has a start. **I can create a sequence of connected commands.** To recognise that a sequence of commands can have an order. **I can order notes into a sequence.**	Use digital technology safely and show respect for others when working online. Recognise unacceptable behaviour when using digital technology. Know who to talk to about concerns and inappropriate online behaviour in school. Can decide whether a web page is relevant for a given purpose or question.

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	To explore how digital devices can be connected. **I can recognise that a computer network is made up of a number of devices.** To recognise the physical components of a network. **I can identify networked devices around me.**	carefully. **I can use onion skinning to help me make small changes between frames.** To review and improve an animation. **I can explain ways to make my animation better.** To evaluate the impact of adding other media to an animation. **I can add other media to my animation.** **Desktop publishing** To recognise how text and images convey information. **I can explain the difference between text and images.** To recognise that text and layout can be edited. **I can change font style, size and colours for a given purpose.** To choose appropriate page settings. **I can explain what 'page orientation' means.** To add content to a desktop publishing publication. **I can paste text and images to create a magazine cover.** To consider how different layouts can suit different purposes. **I can match a layout to a purpose.** To consider the benefits of desktop publishing. **I can say why desktop publishing might be helpful.**	**I can create yes/no questions using given attributes.** To identify objects using a branching database. **I can independently create questions to use in a branching database.** To compare the information shown in a pictogram with a branching database. **I can create a branching database that reflects my plan.**	To change the appearance of my project. **I can build a sequence of commands.** To create a project from a task description. **I can implement my algorithm as code.** **Events and actions** To explain how a sprite moves in an existing project. **I can choose which keys to use for actions and explain my choices.** To create a program to move a sprite in four directions. **I can program movement.** To adapt a program to a new context. **I can use a programming extension.** To develop my program by adding features. **I can choose suitable keys to turn on additional features.** To identify and fix bugs in a program. **I can match a piece of code to an outcome.** To design and create a maze-based challenge. **I can implement my design.**	
YEAR 4	**The internet** To describe how networks physically connect to other networks. **I can describe the internet as a network of networks.** To recognise how networked devices make up the internet. **I can identify that the internet is used to provide many services and contains websites and pages.** To outline how websites can be shared via the World Wide Web. **I can identify the types of media that can be shared on the WWW.** To describe how content can be added and accessed on the World Wide Web. **I can explain that internet services can be used to create content online.** To recognise how the content of the WWW is created by people. **I can discuss that websites and their content are created by people.** To evaluate the consequences of unreliable content. **I can explain why I need to think carefully before I share or reshare content.**	**Audio editing** To identify that sound can be digitally recorded. **I can use a computer to record audio.** To use a digital device to record sound. **I can edit using trimming and re-recording.** To explain that a digital recording is stored as a file. **I can plan and save appropriate content for a podcast.** To explain that audio can be changed through editing. **I can record content following my plan.** To show that different types of audio can be combined and played together. **I can arrange multiple sounds to create the effect I want.** To evaluate editing choices made. **I can evaluate the effectiveness of my / another podcast.** **Photo editing** To explain that digital images can be changed. **I can use photo editing software to crop an image and explain why.** To change the composition of an image. **I can experiment with different colour effects.** To describe how images can be changed for different uses. **I can identify how a photo edit can be improved.** To make good choices when selecting different tools. **I can experiment with tools to select and copy part of an image.** To recognise that not all images are real. **I can create a project that is a combination of other images.** To evaluate how changes can improve an image. **I can use feedback to guide making changes.**	**Data logging** To explain that data gathered over time can be used to answer questions. **I can choose a data set to answer a given question.** To use a digital device to collect data automatically. **I can identify that data from sensors can be recorded.** To explain that a data logger collects 'data points' from sensors over time. **I can talk about the data that I have captured.** To use data collected over a long duration to find information. **I can explain that there are different ways to view data.** To identify the data needed to answer questions. **I can use data loggers to collect data to answer questions.** To use collected data to answer questions. **I can identify the benefits of using a data logger.**	**Repetition in shapes** To identify that accuracy in programming is important. **I can program a computer by typing commands.** To create a program in a text-based language. **I can use a template to draw what I want my program to do.** To explain what 'repeat' means. **I can identify repetition in everyday tasks.** To modify a count-controlled loop to produce a given outcome. **I can predict the outcome of a program containing a count-controlled loop.** To decompose a task into small steps. **I can explain that a computer can repeatedly call a procedure.** To create a program that uses count-controlled loops to produce a given outcome. **I can make use of my design to write a program.** **Repetition in games** To develop the use of count-controlled loops in a different programming environment. **I can list an everyday task as a set of instructions including repetition.** To explain that in programming there are infinite loops and count controlled loops. **I can explore loops to produce a given outcome.** To develop a design which includes two or more loops which run at the same time. **I can explain what the outcomes of a repeated action should be.** To modify an infinite loop in a given program. **I can identify which parts of a loop can be changed.** To design a project that includes repetition. **I can develop my own design explaining what my project will do.** To create a project that includes repetition. **I can build a program that follows my design.**	Demonstrate that they can act responsibly when using computers. Understand the difference between acceptable and unacceptable behaviours when using digital technology. Know who to talk to about concerns and inappropriate behaviour at home or in school. Can decide whether digital content is relevant for a given purpose or question.
YEAR 5	**Systems and Searching** To explain that computers can be connected together to form systems. **I can describe the input, process, and output of a digital system.** To recognise the role of computer systems in our lives. **I can identify tasks that are managed by computer systems.** To identify how to use a search engine. **I can make use of a web search to find specific information.** To describe how search engines select results. **I can explain why we need tools to find things online.** To explain how search engines are ranked. **I can explain that a search engine follows rules to rank results.** To recognise why the order of results is important, and to whom. **I can describe some of the ways that search results can be influenced.**	**Video production** To explain what makes a video effective. **I can explain that video is a visual media format.** To use a digital device to record video. **I can identify and find features on digital video recording device.** To capture video using a range of techniques. To create a storyboard. **I can create and save video content.** To identify that video can be improved through reshooting and editing. **I can explain how to improve a video by reshooting and editing** To consider the impact of the choices made when making and sharing a video. **I can evaluate my video and share my opinions.** **Introduction to Vector graphics** To identify that drawing tools can be used to produce different outcomes. **I can experiment with the shape and line tools** To create a vector drawing by combining shapes. **I can move, resize, and rotate objects I have duplicated** To use tools to achieve a desired effect. **I can explain how alignment grids, resize handles and zoom can be used to improve consistency** To recognise that vector drawings consist of layers. **I can change the order of layers in a vector drawing** To group objects to make them easier to work with. **I can reuse a group of objects to further develop my vector drawing** To apply what I have learned about vector drawings. **I can create a vector drawing for a specific purpose.**	**Flat-file databases** To use a form to record information. **I can order, sort, and group my data cards** To compare paper and computer-based databases. **I can choose which field to sort data by to answer a given question** To outline how grouping and then sorting data allows us to answer questions. **I can group information using a database** To explain that tools can be used to select specific data. **I can choose multiple criteria to answer a given question** To explain that computer programs can be used to compare data visually. **I can select an appropriate chart to visually compare data** To apply my knowledge of a database to ask and answer real-world questions. **I can refine a search in a real-world context**	**Selection in physical computing** To control a simple circuit connected to a computer. **I can program a microcontroller to make a LED switch on.** To write a program that includes count-controlled loops. **I can use count–controlled loop to control outputs.** To explain that a loop can stop when a condition is met, eg number of times. **I can explain that a condition is either true or false.** To explain that a loop can be used to repeatedly check whether a condition has been met. **I can explain that a condition being met can start an action.** To design a physical project that includes selection. **I can identify a real-world example of a condition starting an action.** To create a program that controls a physical computing project. **I can write an algorithm that describes what my model will do.** **Selection in quizzes** To explain how selection is used in computer programs. **I can identify conditions in a program.** To relate that a conditional statement connects a condition to an outcome. **I can create a program that uses selection to produce different outcomes.** To explain how selection directs the flow of a program. **I can show that a condition can direct program flow in one of two ways.** To design a program which uses selection. **I can identify the outcome of user input in an algorithm.** To create a program which uses selection. **I can test my program.** To evaluate my program. **I can identify ways the program could be improved.**	Demonstrate that they can act responsibly when using the internet. Discuss the consequences of particular behaviours when using digital technology. Know how to report concerns and inappropriate behaviour in a range of contexts. Can decide whether digital content is reliable and unbiased.

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YEAR 6	Communication	Web page creation	Spreadsheets	Variables in games	
	To explain the importance of internet addresses	To review an existing website and consider its structure.	To identify questions which can be answered. using data.	To define a 'variable' as something that is changeable.	Show that they can think through the consequences of their actions when using digital technology.
	I can explain that internet devices have addresses	**I can discuss the different types f media used on websites.**	**I can enter data into a spreadsheet**	**I can identify examples of information that is variable.**	Identify principles underpinning acceptable use of digital technologies.
	To recognize how data is transferred across the internet	To plan the features of a web page.	To explain that objects can be described using data.	To explain why a variable is used in a program.	Know a range of ways to report concerns and inappropriate behaviour in a variety of contexts.
	I can explain that data is transferred over networks in packets	**I can recognize the common features of a web page.**	**I can explain what an item of data is.**	**I can recognize that the value of a variable can be changed.**	Can form an opinion about the effectiveness of digital content.
	To explain how sharing information online can help people to work together	To consider the ownership and use of images (copyright).	To explain that formula can be used to produce calculated data.	To choose how to improve a game by using variables.	
	I can explain that the internet allows different media to be shared.	**I can say why I should use copyright-free images.**	**I can construct a formula in a spreadsheet.**	**I can decide where in a program to change a variable.**	
	To evaluate different ways of working together online	To recognise the need to preview pages.	To apply formulas to data, including duplicating.	To design a project that builds on a given example.	
	I can identify different ways of working together online	**I can add content to my own web page.**	**I can calculate data using different operations.**	**I can create algorithms for my project**	
	To recognise how we communicate using technology.	To outline the need for a navigation path.	To create a spreadsheet to plan an event**.**	To use my design to create a project.	
	I can choose methods of communication to suit particular purposes.	**I can explain what a navigation path is.**	**I can apply a formula to calculate the data I need to answer questions.**	**I can choose a name that identifies the role of a variable.**	
	To evaluate different methods of online communication.	To recognise the implications of linking to content owned by other people.	To choose suitable ways to present data.	To evaluate my project.	
	I can explain that communication online may be private therefore can decide when I should or shouldn't share information.	**I can create hyperlinks to other people's work.**	**I can produce a chart.**	**I can identify ways that my game could be improved.**	
		3D modelling		**Sensing**	
		To use a computer to create and manipulate three- dimensional (3D) digital objects.		To create a program to run on a controllable device.	
		I can add 3D shapres to a project.		**I can test my program on an emul;ator.**	
		To compare working digitally with 2D and 3D graphics.		To explain that selection can control the flow of a program.	
		I can lift/lower 3D objects		**I can identify examples of conditions in the real world.**	
		To construct a digital 3D model of a physical object.		To update a variable with a user input.	
		I can rotate, duplicate and group 3D objects		**I can use a condition to change a variable.**	
		To identify that physical objects can be broken down into a collection of 3D shapes.		To use an conditional statement to compare a variable to a value.	
		To design a digital model by combining 3D objects.		**I can use an operand in an if, and then statement.**	
		I can accurately size 3D objects.		To design a project that uses inputs and outputs on a controllable device.	
		I can choose objects to use in a 3D model		**I can design the algorithm for my project**	
		To develop and improve a digital 3D model.		To develop a program to use inputs and outputs on a controllable device.	
		I can construct a 3D model based on a design.		**I can create a program based on my design.**	