Curriculum Progression- Computing

Our Computing Concepts							
KS1	Computer skills						
	Information Technology					Problem Solving	Online Safety
KS2	**Creating Media**	**Data & Information**	**Design and Development**	**Computing Systems & Networks**	**Impact of Technology**	**Programming and Algorithms**	**Safety and Security**
	Being able to select, create and remix a range of media including text, images, sounds and video in order to present information and express creativity.	Knowing how data is collected, stored, organised, presented and analysed in order to solve real world problems.	Planning, creating and evaluating computing artefacts for a specific purpose and audience.	Understanding the input > process > output model of a computer, the uses of information technology, how networks (including the Internet) are used to share information, and other computing systems such as artificial intelligence.	How individuals, systems, and society interact with computer systems, and the impact it has in terms of ethics, bias, accountability etc.	How we design, write and evaluate effective algorithms to solve problems and execute these as programs using specific software and hardware. Understanding program flow in terms of sequence, repetition, selection and variables.	Understanding risks when using technology and how to protect individuals and systems, including reinforcing key online safety messages.

		Year 3					
Topic Knowledge	**Computing topic**	**Basic Skills**	**Communicating: Text and Images**	**Communicating: Media**	**Understanding & Sharing Data**	**Programming A**	**Programming B**
	Sheffield Primary Computing Scheme Link	**Skills from KS1 that are to be taught in the new context of desktop computers.**	**What makes a good poster?**	**How do I use the computer as a musician?**	**How do we use databases to find out information?**	**How do I sequence events?**	**How do I use count-controlled loops in programs?**
	Link to school values	Together we are problem solvers	Together we do our best	Together we do our best	Together we are problem solvers	Together we are problem solvers	Together we are problem solvers
	Program	*Word*	*Publisher*	*Chrome Music Lab*	*Excel*	*Scratch*	*Scratch*
	Devices	*PC*	*PC*	*PC*	*PC*	*PC*	*PC*
	New Key Vocabulary	mouse keyboard microphone webcam Central Processing Unit (CPU) Microphone speakers monitor/screen clicking double-clicking desktop taskbar Start menu Enter Spacebar backspace/delete dragging	Image Graphic Copyright Design	Audio Tempo Pitch Loop Export Track	Database Record Field Search	Input Event Code	Sequence Repetition Loop Command Count-controlled loop
	End points	In the Infant school they use iOS to learning about Computing and therefore this is their first experience of a computer network, Windows operating system and Microsoft products. Children will be able to complete a range of basic skills on Microsoft Word.	This is the first unit in which children use Microsoft Publisher at DJS. The children will experience evaluating good design. The children will then learn to create their own digital content and edit their own content to improve it according to feedback.	Pupils edit existing digital content to make a new version with an awareness of copyright. They evaluate existing and their own digital content, and edit it to improve it according to feedback. They design and create digital content for a specific purpose.	Pupils understand the benefits of using a computer to create charts and databases. They can design a questionnaire and collect a range of data, enter data into a database package and test. Pupils draw conclusions from information stored in a database.	In this series of lessons, Scratch will be introduced to children – key parts of the interface, commands, and how to run and save projects. Pupils will learn about sequence and events in programs. They will have practise in reading, predicting the outcome of, and modifying code, before designing their own programs using a range of events and sounds.	In this series of lessons students will revise their knowledge of algorithms and plan out simple programs based on an algorithm. They will learn how to add the Pen extension in Scratch and use count-controlled loops to draw shapes. They will learn about repetition and how this is used to make programs more efficient.
	Crucial knowledge **(also in bold in other sections)**	• **Start up and shut down the Computer safely** • **Use a simple password when logging on, where relevant** • **Learn how to hold and move the mouse.** • **To know how to click, double-click and drag items around a screen**	• **Information and images can be copied and pasted onto a document.** • **Text boxes and images can be organised into different layouts.** • **Objects are layered, the order of these layers can be changed.**	• **A computer records audio.** • **Recordings can be edited through trimming unwanted sounds.** • **A person who records the sound is the one who decides who can use it.**	• **A database consists of records and each record contains 'fields'.** • **Records can be grouped.** • **Fields can be searched by asking and answering questions.**	• **Commands in Scratch are shown as blocks.**	• **Algorithms can be expressed in plain English.** • **A loop is used to repeat a set of commands.** • **A count-controlled loop repeats a sequence a set number of times.**

		• **Learn how to open a basic program and close it properly.** • **Learn how to close a window.** • **Identify the desktop, taskbar, and Start menu.** • **Use the keyboard for basic typing** • **Know how to use capital letters**					
Substantive Concepts		**Computing Systems & Networks**	**Creating Media**	**Creating Media**	**Data & Information**	**Programming & Algorithms**	**Programming & Algorithms**
		Safety & Security	**Design & Development**	**Design & Development**	**Design & Development**	**Design & Development**	**Design & Development**
			Computing Systems & Networks	**Computing Systems & Networks**	**Computing Systems & Networks**	**Computing Systems & Networks**	**Computing Systems & Networks**
			Impact of Technology	**Impact of Technology**	**Impact of Technology**	**Impact of Technology**	**Impact of Technology**
			Safety & Security	**Safety & Security**	**Safety & Security**	**Safety & Security**	**Safety & Security**

Disciplinary Knowledge in computing is the use and interpretation of substantive knowledge in order to develop original digital content. **Knowledge of the practices of computing (how to…)**							
Skills		• Identify and explain the parts of a Desktop Computer: monitor, keyboard, mouse, Central Processing Unit (CPU), webcam, microphone and speakers • Recognise and use a range of input devices: mouse, keyboard, microphone, webcam • Recognise and use a range of output devices, e.g. printer, speakers, monitor/screen	• Explain why we need to keep our password safe. • Remember and use an individual password • Add an image to a document from the internet. • Resize and move an image in a document Know how to copy and paste text or images in a document. • Crop an image and apply simple filters • Recognise that school computers are connected together on a network.	• **To save compositions as a wav file into their folder** • **To share a weblink to allow another user to access it** • Use a search engine to find simple information.	• Use a keyboard effectively to type in text. • Level 1 of Dance Mat Typing	• Level 1 of Dance Mat Typing	Level 1 of Dance Mat Typing
	Substantive knowledge in computing is understanding how to use technology, how to be safe and knowing how to program. **• Knowledge of hardware, software, programs and applications**						
Computer Science - The design of new software, the solution to computing problems and the development of different ways to use technology	**Algorithms and Programming**					• **To become familiar with the Scratch programming environment: how to add and delete a sprite, how to add and delete code, how to run code, simple code blocks** • To understand what an algorithm is: a precise set of instructions that can be followed by a human or a computer to achieve a task • Predict the outcome of a block or text-based program • Successfully modify an existing program, e.g. change	• **Recognise that changing the sequence of code in a program affects the outcome** • Identify repeated steps in a program or algorithm. • **To create specific shapes using an algorithm in sequence** • To understand repetition in programming and count controlled loops • **To apply repetition in programming and count controlled loops**

						background, number of times things happen. • Recognise that different inputs (events) can be used to control a program. • Identify errors in a block or text-based program and correct them. • **To understand that Events can use a variety of inputs: mouse click or keyboard** • Create an algorithm to plan out a program. • To edit and improve existing code using Motion, Sounds and Looks • To create code using Events	• To edit and improve existing code involving repetition and count controlled loops • Use a count-controlled loop (e.g. repeat 3 times) to make a program more efficient. • Recognise that we can create an algorithm to help plan out a program.
	Data				• Design a questionnaire and collect a range of data about themselves: eg circumference of head, hand span etc. • Draw conclusions from information stored in a database.		
	Systems		• Explain how digital devices function (input, output, process) • Identify input and output devices		• Navigate a flat-file database		
Information Technology - The technical knowledge. The use and understanding of hardware and software; computers and electronic systems for storing and using information	**Digital Artefacts**		• Design a poster to advertise junior parkrun at Millhouses Park.	• To create a piece of music that represents a specific objective: conveying a certain animal		• To create a project including Events and Actions (using the Motion, Sounds and Looks tabs)	
	Computing Contexts		• **Together create a list of key features of successful poster design: careful choice of size, colours, images/graphics, layout, fonts.** • Evaluate the key features of design: choices of size, colours, images, layout, fonts. • Identify the advantages and disadvantages of using text and images • Change font style, size and colour for a given purpose • Consider how different layouts can suit different purposes • Define the term 'page orientation'	• To understand the impact of music upon a user – to add emotion and context to games, adverts, films, radio programmes. • To create a change in the pitch and tempo of a composition to change the mood.	• **To understand the concept of a database**		
Digital Literacy - The technical skills. The ability to use information and communication technologies to find, create, evaluate, and communicate	**Mechanics**		• **Teach children how to add a background colour (Page Design – Background)** • **Teach children how to create a Word Art box (Insert – WordArt)** • **Teach children how to insert images (Insert then Pictures)** • Click picture tools, recolour to change the image colour. • Click picture tools, picture border to change the border. • **Click picture tools and crop to crop the image.**	**In Chrome Music Lab, to know how to:** • **add musical notes** • add percussion • change the instrument • **change the tempo** • **how to export or save as a music file**	• Children create a bar chart, a pie chart and a pictogram from a prepared database to visually compare data. • Design a structure for a flat - file database • **Enter data into a database.**		

			• Click picture tools and picture effects to change the effects. • Click picture tools and bring forward/send backward to change the order of the images. • **Teach the children how to insert a text box – Home – draw text box.** • Teach children how to layer boxes				
	Searching/Selecting Information		• Search for information in a single site • Understand that search engines select pages according to keywords found in the content		• **Navigate a simple database using sort and search tools to find information** • Use 'AND' and 'OR' to refine data selection		
	E-Safety (see PD planning – objectives listed here are explicit links with Computing)		• Recognise that digital content belongs to the person who first created it, but we can give permission for others to use it.	• Copyright, in relation to music.	• Recognise when to share personal information and when not to.		

		Year 4				
Topic Knowledge	**Computing topic**	**Communicating: Text and Images**	**Communicating: Media**	**Understanding & Sharing Data**	**Programming A**	**Programming B**
	Sheffield Primary Computing Scheme Link	**How do I use the computer as an artist?**	**What makes an excellent multimedia story?**	**How do computers collect data?**	**How do I decompose programs and create infinite loops?**	**How do I use selection in a program?**
	Link to school values	Together we do our best	Together we do our best	Together we are safe	Together we are problem solvers	Together we are problem solvers
	Program	*Camera App* *Paint.app website* *PC*	*Photostory 3*	*Dataloggers* *Google sheets*	*BeeBots app* *Scratch*	*Scratch*
	Devices	*iPad* *PC* *Lightning Cable*	*iPads* *PC*		*iPads*	*PC or iPad*
	New Key Vocabulary	Analogue Digital Hardware Software Crop Resize Edit Layer Enhance Saturation Temperature Effects Focus	Sound Text Image Video File Transition Duplicate Frame Animation Effect Soundtrack Narration	Input Device Sensor Data Logger Logging Data Point Interval Analyse Data Set Import Export	Co-ordinates Forever loop Decomposition	Flow Condition operator
	End points	Pupils design and create simple digital content by combining media for a purpose/audience, e.g. digital art. They edit digital content to improve it, e.g. crop images, and can identify the features of a good piece of digital content. Pupils can explain why we use technology to create digital content and recognise why we use different types of media to convey information, e.g. text, image, audio, video. They recognise that digital content belongs to the person who first created it, but we can give permission for others to use it.	Pupils design and create simple digital content by combining media for a purpose/audience. They edit digital content to improve it. Pupils recognise why we use different types of media to convey information. They recognise that digital content belongs to the person who first created it, but we can give permission for others to use it. They are aware that games and films have age ratings.	Pupils will consider how and why data is collected over time. Pupils will consider the senses that humans use to experience the environment and how computers can use special input devices called sensors to monitor the environment. Pupils will collect data as well as access data captured over long periods of time. They will look at data points, data sets, and logging intervals. Pupils will spend time using a computer to review and analyse data. Towards the end of the unit, pupils will pose questions and then use data loggers to automatically collect the data needed to answer those questions.	In this series of lessons pupils will revisit how to use the Pen extension in Scratch, and create their own drawing programs. They will start to decompose projects to help with planning and debugging, and learn about infinite loops that can be used to keep things happening in a program. Finally, they will create their own screensaver program using what they have learnt.	In this series of lessons pupils will consolidate their knowledge of infinite loops, and learn about selection, and how this changes the output of a program depending on whether a condition is met. They will create a simple quiz, using user input, and design their own simple 'choose your own adventure' stories.
	Crucial knowledge **(Also in bold in other sections)**	• **Cropping an image changes the size of the photo.** • **Colour effects can be added to edit a photo.** • **Parts of a photo can be copied, edited or removed.** • **Page orientation means either portrait or landscape.**		• **Data can be gathered over time.** • **A datalogger contains sensors that collect information from the environment.** • **Questions can be created based on logged data**	• **A forever loop repeats a sequence continuously.** • **Co-ordinates can be used to identify points within scratch**	• **Decision making is known as selection, and is implemented in programming using IF statements**
Substantive Concepts		**Creating Media**	**Creating Media**	**Data & Information**	**Programming & Algorithms**	**Programming & Algorithms**
		Design & Development	**Design & Development**	**Design & Development**	**Design & Development**	**Design & Development**
		Computing Systems & Networks	**Computing Systems & Networks**	**Computing Systems & Networks**	**Computing Systems & Networks**	**Computing Systems & Networks**
		Impact of Technology	**Impact of Technology**	**Impact of Technology**	**Impact of Technology**	**Impact of Technology**
		Safety & Security	**Safety & Security**	**Safety & Security**	**Safety & Security**	**Safety & Security**

Automaticity	**Skills**	• Recognise that you can organise files using folders. • Explain what a good file name would look like. • Delete and move files. • Know how to copy and paste text or images in a document. • Remix and edit a range of existing and their own media to create content.	• Children download Photos to PupilShare with a lightning cable.	• Use key parts of a keyboard effectively, e.g. shift, arrow keys, delete). • Level 2 of Dance Mat Typing	• Level 2 of Dance Mat Typing	• Level 2 of Dance Mat Typing
Computer Science	**Algorithms and Programming**				• **Pupils recognise that we can decompose projects to make them easier to plan and debug.** • To use co-ordinates within code in order to identify points • **Recognise a forever loop in a program or algorithm.** • **Use a forever loop in a program to keep something happening.** • Explain when to use forever loops and count-controlled loops, and use them effectively in programs. • To apply infinite loops in a coding project	• To explore new blocks in the Scratch programming environment: hide / show / go to random position • To understand flow in programming • Recognise selection in a program or algorithm. • Use simple selection in algorithms and programs to change what happens depending on if a condition is met, e.g. if…then… • To modify code including the selection statement and ask block. • **To create code including the selection statement and ask block.** • Recognise common mistakes in programs and how to correct them
	Data			• choose a data set to answer a given question • suggest questions that can be answered using a given data set • identify data that can be gathered over time • explain what data can be collected using sensors • use data from a sensor to answer a given question • identify that data from sensors can be recorded • identify a suitable place to collect data • identify the intervals used to collect data • talk about the data that I have captured • view data at different levels of detail • sort data to find information • explain that there are different ways to view data • propose a question that can be answered using logged data • plan how to collect data using a data logger • use a data logger to collect data • interpret data that has been collected using a data logger		

				• draw conclusions from the data that I have collected • explain the benefits of using a data logger		
	Systems	• Use a standard search engine to find • information • Understand that search engines rank pages according to relevance				
Information Technology	**Digital Artefacts**	• Collect, organise and present information using a range of media: Create photo montage in Publisher using self-created images and photos that they have taken. • Design and create digital content for a specific purpose. • Edit digital content to improve it according to feedback. • Explain the benefits of using technology to present information. • Appreciate that you need to use specific software to work with video, images, audio	• Collect, organise and present information using a range of media: Create Microsoft PhotoStory with a range of images that the children have taken and apply effects to the PhotoStory. • Design and create digital content for a specific purpose. • Edit digital content to improve it according to feedback. • Explain the benefits of using technology to present information. • Appreciate that you need to use specific software to work with video, images, audio	• Explain the benefits of using technology to present information.	• To apply decomposition and infinite loops to an independent project.	• Create a Run the 'Choose your own story' program using the skill that have been developed.
	Computing Contexts	• **Collaborate with peers using online tools: Children upload their Publisher document to Google Drive to share it with others** • Recognise that school computers are connected together on a network.	• **Evaluate the key features of a digital content: choices of size, colours, images, layout, fonts.** • Discuss how these effects can enhance or distract from a story.	• **Recognise that school computers are connected together on a network.** • **Know how a computer network can be used to share information:** • **Recognise that a computer network is made up of a number of devices: cables, LAN, server, clients, WiFi point, peripherals, whiteboards, mice, printers, keyboards.** • Explain the role of a switch, server, and wireless access point in a network		
Digital Literacy	**Mechanics**	• **Copy and paste images from Google** • Change borders • **Resizing images in Publisher** • Discuss how the original image size (small, medium or large) affects the quality of the picture one the size is increased • **Discuss the difference between close up photos and wider shots.** • **Discuss how to focus an image by touching the screen and waiting so that it is not blurry.** • Crop an image and apply simple filters. • **Teach the children how to rotate images (Click images and drag rotate handle).** • **Teach children how to insert shapes (Insert, shapes) which will give contrast to their images.**	**In Microsoft Photo Story, to know how to:** • **Inserting images,** • **changing the order,** • **animating the images,** • **add slide transitions text.** • **adding titles,** • **motion effects,** • **transitions and audio – adding a narration or music soundtrack.**	• **Children program a microbit to collect data** • **Enter data into a spreadsheet** • **Pupils create graphs about their data.** • **Select an appropriate graph to visually compare their own data** • **Create and edit a shared Google Document**		
	Searching/Selecting Information	• **Children collate images in Microsoft Publisher using copy and paste from a Google image search.** • Children use the image filter on Google to find different sized images				

	E-Safety (see PD planning – objectives listed here are explicit links with Computing)	• Know where to find copyright-free content • Knowledge of Digital Footprints • Recognise the benefits and risks of different apps and websites.	• Know where to find copyright-free content • Recognise the benefits and risks of different apps and websites.	• Know that information on the internet can be edited by anyone: wiki		

		Year 5				
Topic Knowledge	**Computing topic**	**Communicating: Text and Images**	**Communicating: Media**	**Understanding & Sharing Data**	**Programming A**	**Programming B**
	Sheffield Primary Computing Scheme Link	**How do we collaborate online?**	**How do I create a radio advert?**	**How do I find and share data safely and responsibly?**	**How do I include selection and variables in my programs?**	**How do I program physical systems?**
	Link to school values	Together we are safe	Together we do our best	Together we are safe	Together we are problem solvers	Together we are problem solvers
	Program	*Google Docs*	*Audacity*	*Google/Web Browser*	*Scratch*	*Scratch*
	Devices	*PC*	*PC*	*PC*	*PC*	*PC*
	New Key Vocabulary	World Wide Web Website Internet Browser URL Wiki Copyright Hyperlink Digital footprint	Media Trim Clip Sound effect Loop	server wireless access point Switch network cables network sockets router network security network switch Search search engine refine Index crawler bot Ordering Ranking links algorithm search engine optimisation (SEO) content creator selection	Variable Sensing	Output Physical System Sensor Simulation Flowchart
	End points	Pupils design and create digital content for a specific purpose - a website. They edit digital content to improve it according to feedback, and can identify the features of a good piece of digital content and apply these in own design. Pupils can explain the benefits of using technology to present information and know where to find copyright-free content. They collaborate with peers using online tools - Google Drive. They recognise what kinds of websites are trustworthy sources of information.	Pupils design and create digital content for a specific purpose. They edit digital content to improve it according to feedback, and can identify the features of a good piece of digital content and apply these in own design. Pupils can explain the benefits of using technology to present information and know where to find copyright-free content.	Pupils recognise that school computers are connected together on a network, and that the Internet is made up of computers and other digital devices connected together all around the world. Pupils know that you use a web browser to access information stored on the internet, and use a search engine effectively to find information and images. They recognise what kinds of websites are trustworthy sources of information and the benefits and risks of different apps and websites.	In this series of lessons pupils will consolidate their knowledge about selection and how this can be used to create simple games in Scratch. They will make their own maze game and practise drawing their own backgrounds.	In this series of lessons pupils will learn about physical systems that involve computers. They will investigate different inputs and outputs, and combine loops, selection statements and variables to create their own classroom sound meter.
	Crucial knowledge **(Also in bold in other sections)**	• **The World Wide Web contains websites and web pages** • **Content on the internet is created and owned by individuals.** • **Copyright is used to protect original work.** • **Pages are linked together by navigation paths.** • **Files can be shared over the internet to allow for collaborative work.**		• **A computer network is formed when two or more computers are connected.** • **The internet is a network of networks.** • **A computer system features inputs, processes and outputs.** • **Data is transferred across the internet and networks in packets.** • **Computers use addresses to access websites.** • **There are a range of different search engines.** • **Search results can be influenced and ranked**	• **Variables to store information that might change and can be used later in our program.**	• **Physical System: A system made up of components (e.g. sensors, motors, lights) that work together, often controlled by a computer or microcontroller.** • **Sensor: A device that detects physical conditions (like light, sound, movement, or temperature) and sends data to the system.**
Substantive Concepts		**Creating Media**	**Creating Media**	**Data & Information**	**Programming & Algorithms**	**Programming & Algorithms**
		Design & Development	**Design & Development**	**Design & Development**	**Design & Development**	**Design & Development**
		Computing Systems & Networks	**Computing Systems & Networks**	**Computing Systems & Networks**	**Computing Systems & Networks**	**Computing Systems & Networks**

		Impact of Technology	**Impact of Technology**	**Impact of Technology**	**Impact of Technology**	**Impact of Technology**
		Safety & Security	**Safety & Security**	**Safety & Security**	**Safety & Security**	**Safety & Security**
Automaticity	**Skills**	• Use common keyboard shortcuts, e.g. ctrl C (copy), ctrl V (paste). • Explain what makes a strong password. • Use folders to organise files. • Consider the audience when designing and creating digital content.	• Know how to mute and unmute audio on a computer or tablet. • Know how to search for an application on a computer/tablet. • Consider the audience when designing and creating digital content.	• Type using fingers on both hands • Level 3 of Dance Mat Typing	• Type using fingers on both hands • Level 3 of Dance Mat Typing	• Type using fingers on both hands • Level 3 of Dance Mat Typing
Computer Science	**Algorithms and Programming**					
	Data			• Explain the difference between data and information. • Appreciate that different programs work with different types of data, e.g. text, number, video.		
	Systems	• Describe how content can be added and accessed on the World Wide Web • Recognise how the content of the WWW is created and shared by people • Recognise the benefits of using technology to collaborate with others • Explain how sharing information online lets people in different places work together • Contribute to a shared project online • Evaluate different ways of working		• Describe how the world wide is part of the internet • Recognise the role of computer systems in our lives	• **Explain why we use selection, and use two-way selection in programs and algorithms, i.e. if…then…else…** • To analyse a program that uses selection • **To design a program that uses selection** • Recognise variables in a program and what they do. • - Create and use simple variables, e.g. to keep score. • Design a program for a purpose. • Decompose into parts and create an algorithm for each part	• **To understand Inputs and Outputs in Scratch** • To understand Inputs and Outputs in the context of a simulation of a physical system • To understand sensing in programming • Name a range of sensors in physical systems. • Recognise that different solutions may exist for the same problem. • Predict what will happen in a program or algorithm when the input changes (e.g. sensor, data or event). Create an algorithm for a physical system containing a sensor and implement it as a program. • Evaluate a program and make improvements accordingly. • **To create a physical system simulation that uses an input** • To design a program that uses a physical system that uses sensors
Information Technology	**Digital Artefacts**	• **Children create a shared Google Webpage.**	• Children use a prewritten script to create their own advert		• Children create their own maze game, in which a sprite should be able to move around a maze, and a touching a colour will end the game.	• Children follow a project to simulate a sound meter. Make sure they test them out, debug and refine as necessary.
	Computing Contexts	• **Recognise components of a webpage layout** • To know the key features of software or online tool: Google Sites (These may be called a Wiki – like Wikipedia as everyone can edit it – consider that anyone can post information on the internet, and therefore it may not be reliable.) • **To know that Google is a site for collaborative working.** • **Evaluate the key features of web design: choices of size, colours, images, layout, fonts.**	• To identify key features of audio production: • **A range of different clips** • **Editing that allows each sound to be heard clearly** • **Sound clips in a logical order** • **Sound clips trimmed to remove unwanted audio** • Added sound effects to enhance • Added music to enhance • Copyright free sound effects and music used	• Describe how networks physically connect to other networks: connections between all digital devices around the world via optic fibre, satellite and sub-sea cable • Know the protocols computers have for communicating with each other: IP addresses, DNS, searching for location of IP addresses. • Describe the internet as a network or networks • **Explain that computers can be connected together to form systems** • Identify the benefits of computer networks		

				• Know how information is sent over the internet: packets of data sent via the internet • Know the difference between the Internet and the World Wide Web: internet is the cables, WWW is the content. • **Explore how you access the latter using a web browser (Ensure they know these browsers: Internet Explorer, Safari, Chrome, Firefox).** • Recognise that the World Wide Web contains websites and web pages		
Digital Literacy	**Mechanics**	• **Teach the children the skills of building a website using Google Sites. Use transferable skills are from Google Docs:** ○ **Heading** ○ **Include background heading image** ○ **Include image (including copyright)** ○ **Include textbox** ○ **Hyperlinks to other relevant information**	• **Explore audio editing software** • **Know how to record audio into the software** • **Know how to move clips** • **Know how to delete clips** • **Add new track for concurrent sound** • **Download copyright free sound effects and add them to project**			
	Searching/Selecting Information		• **Searching a specific website for content**	• Know that you use a web browser to access information stored on the internet. • Recognise that the Internet is made up of computers and other digital devices connected together all around the world. • **Make use of a web search to find specific information** • Refine my web search • To understand advanced search techniques for images: Tools, Usage Rights, Creative Commons Licence, size, colour, type, time. • Compare results from different search engines • **Recognise trustworthy websites** • Explain why we need tools to find things online • Recognise the role of web crawlers in creating an index • Relate a search term to the search engine's index • Order a list by rank • Explain that a search engine follows rules to rank results • Give examples of criteria used by search engines to rank results • **Describe some of the ways that search results can be influenced** • Recognise that there is more than one search engine, and they may produce different results. • - Use a search engine effectively to find information and images.		

				• Recognise some of the limitations of search engines • Explain how search engines make money		
	E-Safety (see PD planning – objectives listed here are explicit links with Computing)	• Recognise what kinds of websites are trustworthy sources of information. • Critically evaluate websites for reliability of information. • Demonstrate responsible use of a online services, and know a range of ways to report concerns.	• Know where to find copyright free images and audio, and why this is important.			

		Year 6				
Topic Knowledge	**Computing topic**	**Communicating: Text and Images**	**Communicating: Media**	**Understanding & Sharing Data**	**Programming A**	**Programming B**
	Sheffield Primary Computing Scheme Link	**How do I use the computer as a designer?**	**What makes an excellent film?**	**Why do we use spreadsheets?**	**How do I write complex programs?**	**How do I design real-world applications?**
	Link to school values	Together we do our best	Together we do our best	Together we are problem solvers	Together we are problem solvers	Together we are problem solvers
	Program	Paint Publisher	Camera App Movie Maker	Excel	Scratch	Scratch
	Devices	*PC*	*IPad* *PC* Lightning Cables	*PC*	PC	*PC*
	New Key Vocabulary	vector drawing tools vector drawing, duplicate/copy align resize modify layers order group ungroup duplicate	Trim Split Narration Shot Pan Zoom Camera Angle Camera Work Content Storytelling Shots Close Up Wide Shot Bird's Eye View High Angle Eye Level Low Angle Tilted Angle Static object	Spreadsheet Formula Cell	Operator Set command Change command	Random
	End points	In this unit, learners start to create vector drawings. They learn how to use different drawing tools to help them create images. Learners recognise that images in vector drawings are created using shapes and lines, and each individual element in the drawing is called an object. Learners layer their objects and begin grouping and duplicating them to support the creation of more complex pieces of work.	Pupils remix and edit a range of existing and their own media to create content, and consider the audience when designing and creating digital content. Pupils identify success criteria for creating digital content for a given purpose and audience, and evaluate their own content against success criteria and make improvements accordingly. They know where to find copyright free images and audio, and why this is important.	Pupils recognise what a spreadsheet is and what it is used for. They use simple formulae in a spreadsheet to find out information from a set of data, and produce simple graphs. Pupils can create a simple spreadsheet based on data they have collected.	In this series of lessons pupils will consolidate their knowledge about selection, repetition and variables and use this to create more complex games in Scratch.	In this series of lessons pupils will learn about a range of physical systems and other real-world applications that use computers. They will consolidate their knowledge of sensors, loops, election statements and variables in order to create their own real-world application.
	Crucial knowledge **(Also in bold in other sections)**	• **Elements added to a vector drawing are objects** • **Children use keyboard shortcuts: Cut (Ctrl + X), copy (Ctrl + C) and paste (Ctrl + V) to move an image from a file into a Word Document** • **To understand that different parts of a vector drawing can be layered** • **How to select multiple objects and group/ungroup them** • **Alignment grids improve the consistency of the drawing**	• **A video is a visual media format.** • **Different camera angles help to make a video more effective.** • **Videos can be reshot and edited.**	• **Each cell can be individually formatted.** • **Formulas can be used to produce calculated data.** • **A formula can be duplicated and applied to multiple cells.**	• **Variables to store information that might change and can be used later in our program.** • **Explain why we use selection, and use two-way selection in programs and algorithms, i.e. if…then…else…** • **A forever loop repeats a sequence continuously/a count-controlled loop repeats a specific number of times**	• **AI is when machines are designed to perform tasks that usually require human intelligence.** • **AI doesn't "think" or "feel" like humans—it's based on data and patterns.** • **AI learns from large sets of data. AI makes predictions or decisions by spotting patterns.** • **Machine Learning (ML): A branch of AI where computers learn from data (often shown as training a model).**
Substantive Concepts		**Creating Media**	**Creating Media**	**Data & Information**	**Programming & Algorithms**	**Programming & Algorithms**
		Design & Development	**Design & Development**	**Design & Development**	**Design & Development**	**Design & Development**
		Computing Systems & Networks	**Computing Systems & Networks**	**Computing Systems & Networks**	**Computing Systems & Networks**	**Computing Systems & Networks**
		Impact of Technology	**Impact of Technology**	**Impact of Technology**	**Impact of Technology**	**Impact of Technology**
		Safety & Security	**Safety & Security**	**Safety & Security**	**Safety & Security**	**Safety & Security**

Automaticity	**Skills**	• **Children use keyboard shortcuts: Cut (Ctrl + X), copy (Ctrl + C) and paste (Ctrl + V) to move an image from a file into a Word Document**				
Computer Science	**Algorithms and Programming**					• To recap sequence, repetition and selection in programming. • To add a translate variable extension into a program • To use multiple variables in a program
	Data			• create formulae to perform the four operations • create formulae to perform more complex operations: SUM, how to calculate difference, average • Calculate the mean, mode, median and range • To understand the benefits of a spreadsheet with rapidly changing data • Evaluate results in comparison to the question asked • Choose suitable ways to presents data such as a graph		
	Systems				• To recap variables and add them to a complex project • **A set command will set a variable to a specific value.** • **A Change command will change a variable by a specific amount.** • To explore and analyse complex programs containing an Operator block that compares the value of two things, Time Limits variable, Difficulty and Levels.	• To use sensors within a physical simulation
Information Technology	**Digital Artefacts**	• **Create vector graphics in Publisher** • Children create poster in Publisher using vector images, supplemented by raster/bitmap images from Paint.	• Children create a one minute video with multiple shots retelling the opening scene from Macbeth.	• Create a spreadsheet to plan for a purpose		• To create a program that draws upon elements of AI • To create a project using translation, chatbot, face sensing, art or music
	Computing Contexts	• **Evaluate logo design: simple, saleable, memorable, versatile, relevant** • Know the difference between raster and vector graphics: Raster graphics are forms of images, such as jpgs. If we scale them, they may get pixelated. Vector graphics do not become pixelated when scaled. • **Evaluate digital content: Overall purpose: Simple, Memorable/Impactful, Relevant** • **Design: Few words, Bold Text, Strong colours, Clear contrast between text and background, Clear pictures, Repeating pictures, Clear tag line** • They evaluate their own content against success criteria and make improvements accordingly.	• Pupils understand that the iPad and the PC have different operating systems: IPad – iOS, PC – Windows. • They understand the main functions of an operating system: • It determines the look and feel of the interface • The programs that run on the computer • The OS manages the hardware connected to it • They evaluate their own content against success criteria and make improvements accordingly.			• To understand the concept of machine learning • To understand bias in GenerativeAI • To consider the advantages and disadvantages of using Generative AI
Digital Literacy	**Mechanics**	• **How to select multiple objects and group/ungroup them**	• **To know different types of camera angle: bird's eye, high angle, eye level angle, low angle, tilted angle, close up, wide shot.** • **To use video cameras to capture still and moving subjects** • **Know how to edit video clips using trim and split clip tools.**	• **Shortcut to fill columns and rows with the same formulae** • **Create graphs from data in a spreadsheet**		

			• Know how to add titles, credits, music/sound effects and transitions. • *Plan video out on a storyboard, with quick sketches for each image and notes for the type of shot that they are using.*			
	Searching/Selecting Information	• **Use of a range of search engines appropriate to finding information that is required** • **Understand that search engines rank pages based on the number and quality of inbound links**	•			
	E-Safety (see PD planning – objectives listed here are explicit links with Computing)	• To question the reliability of websites	• To recap the concept of copyright in relation to film, music and sound effects. • To understand the purpose of PEGI ratings		•	