COMPUTING- KNOWLEDGE PROGRESSION

	Year 3	Year 4	Year 5	Year 6
Computer Systems and networks **Y3-** Connecting computers **Y4-** The Internet **Y5-** Sharing information **Y6-** Communication	• L1 How does a digital device work?- A digital device is a machine or device with a computer inside, that has been programmed for a specific task. Digital devices must accept an input, follow a process and produce an output. • L2 What parts make up a digital device?- Input devices give information to a computer system. Output devices send processed information back out of a computer system. • L3 How do digital devices help us?- Digital devices allow us to easily edit our work and undo our mistakes. Non-digital devices are more personal and cost less. • L4 How am I connected?- A network switch is a device that allows many devices on a network to be connected. A network switch helps a computer to send a message directly to another computer. • L5 How are computers connected?- A computer network is made up of a number of devices. A server stores files on a network. A wireless access point allows devices with Wi-Fi to connect to a network. • L6 What does our school network look like?- Devices in a network are connected together by a network switch or wireless access point. Computers, laptops, tablets, printers and servers are networked devices. Networks are connected to other networks via the internet.	• L1 Connecting networks– The internet is a global network of networks. Routers connect networks together, send information around the internet and choose the quickest route for information. • L2 What is the internet made of? – The internet is connected by lots of routers. The World Wide Web is part of the internet where we can visit web pages and websites. • L3 Sharing information– Sounds and sights can be shared on the World Wide Web. Domains can tell you more about the content of the website or where it originates from. Web browsers (Chrome, Firefox and Edge) let you look at web pages on the internet. • L4 What is a website? – Common features of a website are logos, links, videos, pictures and text. Some websites (Scratch, Chrome Music Lab and YouTube) allow you to create your own content. • L5 Who owns the web? – Websites and their content are created by people. Most content is owned by the creator of the content due to copyright laws. • L6 Can I believe what I read?– Not everything online is true, honest, or accurate. People create or share fake information to make money, be popular, gain power or by mistake.	• L1 Systems– Digital systems accept inputs, process them, and then produce outputs. Computer systems communicate with other devices. • L2 Computing systems and us– Pedestrian crossings use computer systems to keep people safe. Catalogue stores use computer systems to process orders quicker. • L3 Transferring information– Google, Bing and DuckDuckGo are websites that are search engines. Searches need to be refined to get more relevant results. Different search engines give different results because they have different indices. • L4 Working together– A search engine uses web crawlers (programmes) to create an index of web pages. When search terms are narrowed, fewer results are returned. • L5 Better working together – Search engines use algorithms to rank webpages. Good webpages attract more links and rank higher. • L6 Shared working- The searcher, the search engine company and the web creator can influence search results. Companies can pay search engines so that their webpages rank higher.	• L1 Internet addresses – Computers communicate with each other over the internet using IP addresses. A Domain Name Server matches IP addresses to website addresses, making it easier for humans to remember. • L2 Data packets– All data transferred over the internet is broken down into packets. When packets are received by a computer, they are reassembled in the correct order. • L3 Working together – The internet allows people to share text and images and work on the same project. The chat tool allows us to communicate with people we are working with. • L4 Shared working – Scratch projects can be remixed without asking for permission from the person who created it. Shared working can save time or allow us to do more advanced things. • L5 How we communicate– People communicate using writing, speech and gestures. People communicate over the internet using emails, instant message, video calls and blog posts. • L6 Communicating responsibly- It is important to consider whether methods of internet communication are public or private, one-way or two-way or one-to-one or one-to-many.

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Creating media **Y3-** Word processing **Y4-** Photo editing **Y5-** Video editing **Y6-** Web Page Creation	• L1 Words and pictures- Text and images can communicate information clearly. Text is writing. Images are pictures. There are advantages and disadvantages to using text and images. • L2 Can you edit?- The text and layout can be edited to communicate a message more clearly. Font style, size and colours can be changed to suit the purpose. • L3 Great template- Page orientation is when you choose which way round you would like to read the page. Placeholders are the boxes that hold the place of the text or image and help to design the layout. A template is a document that has already been laid out in a certain why. • L4 Can you add content?- Text and images can be copied and pasted onto a template. Changes can be made to content after it has been added. • L5 Lay it out- Text is arranged in different ways depending on the purpose of the document. The layout will depend on the message you wish to communicate. • L6 Why desktop publishing? Many people use desktop publishing to help them do their jobs. The benefits are: It helps save time, it is cheaper and documents can be shared easily with others.	• L1 Changing digital images – An image might be edited to remove an unwanted part, to make colours brighter, make it look more appealing or to focus on an important part. Digital images can be cut or cropped to remove a part of the original image. • L2 Changing the composition of images – Work can be saved digitally, using a suitable file name, by pressing right click and SAVE AS. The more pixels in an image, the larger the detail and the more detail it can store. Designers can change the composition of an image by selecting parts of it. • L3 Changing images for different uses – Effects can be applied to images to change the mood. Images can be edited to match a scenario. • L4 Retouching images – An image can be retouched to improve or change it by making it look more attractive or appealing. Retouched images are not accurate. Various editing tools can be used to retouch an image. • L5 Fake images – Not all images are real. Images can be combined to make a composite image using cut, copy and paste. • L6 Making and evaluating a publication – Assessment- It is important to plan a publication before creating it. Font style can be changed to appeal different audiences. Surveys can be used to evaluate the impact of a publication.	• L1 What is a video?– A video is the recording, reproducing or broadcasting of moving visual images that give the illusion of movement. A video can include both visual and audio media to communicate a message clearly. • L2 Identifying devices– Ipads are devices that can record video and sound. A Talking Tin is a device that records only sound. A microphone, camera lens and memory storage are important functions on a recording device. • L3 Using a device– You should never photograph or record someone without their permission. Planning audio and visual content is important to make videos engaging. Static camera, zooming, pan and tilt are techniques that add to the quality of the video. • L4 Features of an effective video– The best videos are carefully planned and scripted. Effective videos use a mix of audio and visual, consider camera angles and light/colour. • L5 Importing an Editing– Devices can be connected to a computer to import and save content. Videos can be improved by reshooting content or editing. Split, trim/clip, remove and undo are editing tools. • L6 Video Evaluation Assessment- Adding special effects add interest for the audience to keep their attention. Completed videos should be saved and exported. Constructive feedback can help improve the quality of the next video.	• L1 What makes a good website?-A website is a collection of information, relating to a particular topic, that can be accessed on a range of devices. A browser allows us to navigate and find our way around the World Wide Web. Websites are made with a special code called HTML. • L2 How would you lay out your web page?– Websites are always created for an audience and a purpose. Header, website name, logo, text and images are the main features of a web page. • L3 Copyright or copyWRONG?– Copyright law protects and controls the work a person creates. Permission, payment or personal credit is needed to use someone else's work. Fair use allows part of someone's content to be used without permission. There are web sites that offer copy free images. • L4 How does it look?– It is important to preview and evaluate what the content looks like on different devices. All users should have access to a webpage that works well and looks good, no matter which device they use. • L5 Follow the breadcrumbs– Breadcrumb trails are important when navigating around a website. Website designs begin with a homepage and can be branched onto subpages using hyperlinks. L6 Think before you link!–Links to outside your own website are external links. The implications when adding an external link are the link may not be found, content may change and the site may not be secure.

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Programming **Y3-** Sequencing sounds **Y4-** Repetition in games **Y5-** Selection in physical computing **Y6-** Variables in games	• L1 Introduction to Scratch – Attributes of a sprite are code, costumes and sounds. Attributes of a stage are code backdrops and sounds. Each block in scratch is a command which controls the sprite or stage. • L2 programming sprites- Each sprite is controlled by the commands I choose. Motion blocks control the movement of a sprite. Motion blocks are ordered to achieve an outcome. • L3 Sequences- Event blocks are used to start a project or the motion of a sprite. A sequence is a pattern or process where one thing follows another. Joined blocks create sequences of code. • L4 Ordering commands- Sound blocks are used to give a sprite its own sound. Sound blocks can be ordered to make a sequence of notes. An algorithm is a precise set of ordered instructions. • L5 Looking good- Motion and sound blocks can be combined to make sequences. Looks blocks are change the appearance of sprites. Backdrops can be added to change the appearance of the stage. • L6 Making an instrument- Sprites can be named to help you identify them. An algorithm can be designed using sound, looks and motion blocks. An Algorithm can be tested and debugged.	• L1 Using loops to create shapes– A loop is repeating commands. Count-controlled loops repeats the blocks for a set number of times. Commands within an infinite loop are repeated over and over again. • L2 Different loops– The 'Repeat forever' block is the infinite loop in Scratch. Count-controlled loops use a 'Repeat' block for a set number of times. • L3 Animate your name– Two or more loops can run at the same time. Action blocks can be used to animate. Animations can start by using the green flag or stop by using the red octagon. • L4 Modifying a game– Loops can be modified in a game. Code can be copied between sprites by dragging code from an existing sprite to a new sprite. • L5 Designing a game– An effective design must include art work and algorithms. Loops are designed in programmes to repeat an algorithm. Feedback allows us to improve the designs of our project. • L6 Creating our games– Assessment- It is important to test and debug the code for one sprite before adding code to other sprites. It is important to evaluate the game making process.	• L1 Connecting Micro-bits– A microbit is an input, process and output device that can be programmed. Infinite loops are loops that can be repeated continually. • L2 Combining output devices– Count-controlled loops continue for a predefined number of times. • L3 Controlling with conditions– A loop can stop when a condition is met. A condition is something that can be either true or false. • L4 Starting with selection – A loop can be used to repeatedly check whether a condition has been met. A condition being met can start an action. • L5 Drawing designs- A design can be used to create a solution for a task. • L6 Writing and testing algorithms- Programs need to be evaluated.	• L1 Introducing a variable- A variable can be set and changed throughout the running of a program. Variables can hold numbers or letters. Score, time and team names are examples of variables. • L2 Variables in programming- A variable can hold one value at a time. All variables have a name and a value. Only the value of the variable can be changed in the running of a program. • L3 Improving a game- The variables score, timer and lives can improve a game. The position of a variable block determines the value of the variable. Operator blocks enable an action to take place when a score reaches a certain value. • L4 Designing a game– A design needs to include art work and algorithms. Art work includes sprites and backgrounds. An algorithm is a precise sequence of instructions, or set of rules, for performing a task. • L5 Design to code– Algorithms are implemented into Scratch as code. Projects are tested by running the code. Debugging is reviewing your algorithm to find and fix errors in your code, then testing again. • L6 Improving to share– A lives variable can be added to extend a game. When evaluating a project, you should be positive, kind and constructive.