**COMPUTING PROGRESSION MAP**

| **Computing Systems and Networks – Autumn 1** |
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| **KNOWLEDGE** | **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
|  | I know what a computer is and what its main parts are called. I know how to use a keyboard and how to edit using the delete key I know how to use technology purposefully. I know I can change the keyboard output to upper and lowercase letters. I know using different fonts and sizes changes the appearance of my work. | I know what information technology is and how it helps people at home, in school and in the wider world. I know that devices are often linked and work together. I know that networks are connected systems I know rules that help keep us safe and healthy in and beyond the home when using technology. | I know digital devices and change the way we work I know what a computer network is and how it works in the school setting. I know what a switch, server and wireless access point are. | I know computers are made from hardware, software and components. I know that websites and their contents are created by people and that some information that I find online may not be honest, accurate or legal. | I know that connect devices can allow is to access shared files stored online. I know that sharing information online lets people in different places work together.  | I know how to search the internet and that I will get different results from different search engines. I know that web crawlers are digital bots that find what I am looking for. I know how to keep myself safe online and that I should not be sharing personal information. I know that if I am communicating online, that my conversations may not be private.   |
| **SKILLS** |  | I can identify technology I can identify the toolbar and use bold and change font and size I can type capital letters I can use the space bar I can find letters on a keyboard to type words I can insert a picture from a picture box I can follow rules for using technology responsibly  | I can recognise the uses and features of information technology: describing some uses of computers and examples of computers. To can identify information technology in school and at home and say what it is used for. I can explain the benefits of IT and how devices work together. I can recognise how to use IT responsibly and that rules are in place to keep me safe and help me. | I can classify input and output devices; design a digital device and model a simple process. I can recognise similarities and differences between using digital devices and non-digital tools. I can explain how a computer network can be used to share information and that messages pass through multiple connections. I can explain how digital devices can be connected and what the role of a switch, server and wireless access point is. I can recognise the physical components of a network and how they are connected. | I can explain how the internet is made up of connected networks. I can explain how websites are stored on the www, what types of media can be shared and how to access websites on the WWW. I can explain that that content of the www is created by people.I can evaluate the consequences of unreliable content. I can name the different parts of a desktop computer and know what the function of the different parts of a computer is. E.g. Make a leaflet labelling a computer. | I can explain how computers are connected together to form systems. I can explain the role that computers have in our lives and how information is transferred over the internet. I can work collectively on a shared project online. I can evaluate different ways of working together online.  | I can search the web for specific information and identify and compare results from different search engines. I can explain that web crawlers are the digital bots that search the internet for index pages for web address. I can explain web pages are ranked and how search engines make money. I can identify that there are different ways to communicate over the internet  |
| **Vocabulary** |  | TechnologyDesktopLaptopComputerMouseTrackpadLoginUsernamePasswordKeyboardEditSpacebar |  Information technologyDevice*Examples of IT- Barcode scanner, printer, tablet, chip and pin machine, card reader* | InputProcess OutputNetworkNetwork componentsServerWireless Access PointNetwork switch | RouterWorld Wide WebOnline content | Digital systemPhysical connectionElectronic connectionComputer systemSearch engineRank Web searchWeb crawlerSeach engine indexContent creator | Web addressIP addressDomain Name Server (DNS)Data packet HeaderData payloadCopyrightInternet communicationInternet collaborationSecurityPrivacy |

| **Creating Media– Autumn 2** |
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| **KNOWLEDGE** | **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
|  | I know how to create an image using a programme. I know how to select different tools to create different effects.  | I know how to take a photograph, thinking about light and composition, I know how to edit my photograph | I know how to create a stop frame animation. I know how to add media to my animation. I know how to use ‘onion skinning.’ | I know what a podcast is. I can record a podcast, editing to make improvements and add sound. | I know how to use Windows Movie Maker and I can edit my video to improve it. I know how to add audio, set my video to music, add a title and credits and change the transition method and length between sections or stills.  | I know how to plan and create a web page, adding content and hyperlinks. I know that some images have copyright. |
| **SKILLS** |  | I can draw lines and make marks on a screen and explain which tools I used I can make marks with the square and line tools I can use the shape and line tools effectively I can use the shape and line tools to recreate the work of an artist I can explain why I have chosen specific tools. | I can capture a digital photograph and talk about how to take a photograph. I can take a photograph in landscape or portrait and explain why one or other might look better. I can identify what is wrong with a photograph and reframe it. To decide how photographs can be improved by using light. I can use editing to change my photograph, experimenting with colour and filters. I can identify if an image is real or if it has been changed. | I can explain that animation is a sequence of drawings or photographs I can create a stop frame animation and predict what it will look like. I can break down a story into setting, characters and events to create a storyboard. I can evaluate the quality of my animation and review a series of frames to check my work. To review and improve an animation explaining how I will improve it. I can evaluate the impact of adding other media to my animation. | I can identify digital devices that can record sound and play it back and that a range of sounds can be recorded. I can plan and record a podcast, saving it as a file. I can discuss how to improve my podcast and edit sections of an audio recording. I can reopen my recording and add sound, using editing tools to rearrange sections of audio. | I can explain that a video can hold visual and audio media. I can plan a video using a storyboard. I can make a recording taking into account light and angles. I can reshot, edit and improve my video and include special effects, title screen and end credits. | I can explore a webpage and identify the different types of media that are used in its construction and its common features. I can plan a design for a webpage that suits my purpose. I can find suitable images and consider the ownership of these images. I can add content to my page, make edits and preview it on a different device. I can make multiple pages and link them using hyperlinks. I can evaluate my the users experience of a website. |
| **VOCABULARY** |  | Paint tools- fill, brush, shape, lineundoSave Retrieve | CaptureDigital photographPortraitLandscapeFormatPhotography compositionRetakeArtificial lightNatural lightCamera focusEffectsEditAdjust  | AnimationFrame Stop-frame animationStory boardSequence of framesOnion skinning | Input device Output deviceMicrophone CopyrightRecordingPodcastSoundwave view‘Trim’ recordingImport Align Layers (in recording)Sound effectBackground musicAudio file | Visual mediaStoreRetrieveExportReshoot | HTML codeWeb layoutCopyrightCopyright-freeFair useNavigation pathHyperlinkUser experience |

| **Programming A – Spring 1** |
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| **KNOWLEDGE** | **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
|  | I know that an algorithm is a set of instructions used to solve a problem or achieve an objective. I know that an algorithm written for a computer is called a program. I know finding errors in an algorithm is called debugging. I know different code blocks have different purposes. |  I know computers require simple, precise instructions to perform. I know how to identify and correct some simple errors (debugging). I am beginning to understand that computer networks provide access to the internet etc. | I know how to write a program, run and debug it. I know how to create a sequence of music within my program. | I know how to create a program with an object that repeats actions.  | I know how to create algorithms for physical computing using loops and sequences. I know the importance of planning and designing a project in order tofollow a plan and make adjustments where necessary. | I know how to design my game, write the algorithms, create the artwork, test and debug.  |
| **SKILLS** |  | I can use a start block in a program I can use more than one block by joining them together I can compare left and right turns I can experiment with turn and move commands to move a physical computer I can use event, action and object code blocksI can select appropriate background artwork for a project. |  I can choose a series of words that can be enacted as a sequence. I can create different algorithms for a range of sequences using the same commands and show the difference in outcomes between two sequences that have the same command. I can predict the outcome of my algorithm and compare this with what did happen. I can explain that programming projects can have code and artwork. I can design a specific algorithm to meet my goal and explain what it should achieve. I can create and debug a program that I have written. | I can explore a new programming environment, including attributes, projects, blocks, commands, codes, staging and backdrops. I can identify that each sprite is controlled by the commands I choose.I can create a sequence of connected commands and decide where and how my program will start. I can combine sound commands and order notes into a sequence to create a musical instrument. To change the appearance of my project. To create a project from a task description. | I can create a code snippet for a given purpose, for example controlling a turtle. I can write an algorithm for a given outcome, including repetition. I can design a program that has a count-controlled loop. I can debug my program. | I can control a simple circuit connected to a computer; including a microcontroller (crumble), an infinity loop and an LED light. I can connect more than one output device to a microcontroller, deciding which output device I control with a count-controlled loop. I can experiment with a ‘do until’ loop. I can use selection (an ‘if …then’ statement) to direct the flow of a program. I can make a physical drawing/model of a physical computing project. I can create an algorithm to control my robot/simulation using repetition, sequencing, coordinates and text inputs. Using crumble or 2code a game linked to our topics. | I can define a ‘variable’ as something that is changeable, variables can hold numbers or letters. I can explain why a variable is used in a program; it is a place holder in memory for a single value. I can choose how to improve a game by using variables. I can design a project that builds on a given example: choosing artwork and creating the algorithm. To use my design to create a project, testing the code that I have written. To evaluate my project |
| **VOCABULARY** |  | RobotDirectionCommandSequencePredict ProgramRun  | OutcomeAlgorithmExecute (run) | ScratchBackdropCodeMotion blockEvent blockMotionStage | Logo (website used)Logo commandCode snippetRepeatLoopCount controlled loopDecompose/ decompositionProcedures   | Crumble controllerProgramming environmentCircuitMicrocontrollerCrumbleSparkleComponent Infinite loopCount-controlled loopConditionConditional loopSelectionAction | VariableProgram variableValue |

| **Data and Information – Spring 2** |
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| **KNOWLEDGE** | **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
|  | I know how to group objects by their properties. | I know how to create a pictogram from collected data in a tally chart. I know how to search for specific information or data. I know that I shouldn’t share personal information online. | I know how to carefully structure a branching database, identifying attributes for grouping and yes/no questions. | I know how to use a data logger to collect data. I know that sensors are the input devices and that the data is recorded.  | I know how to create a database. I know that a databases is a program that is used to store information (attributes) and that you can ask questions (search) a database for answers. I know that you can create graphs and charts to represent your answers. | I know how to format cells to perform a function and that spreadsheets can be used to present data visually. I know to credit sources when inserting media from websites and to check their validity. I know data can be presented numerically or visually, each for different purposes. |
| **SKILLS** |  | I can describe objects using labels and match objects to a group. I can count groups of objects and describe their properties. I can count and group objects with the same properties I can compare groups of objects and answer questions about them. | I can count and compare objects (data) using tally charts, comparing totals. I can enter data on a computer and view that data in a different format: I can use a pictogram to answer simple questions about the data. I can use a tally chart to create a pictogram. I can answer 'more than'/'less than' and 'most/least' questions about an attribute. I can create a pictogram to arrange objects by attributes. I can create a pictogram to compare people by a common attribute. I can explain that we can present information using a computer and that sometimes it is this data should not be shared. | I can create a branching database by grouping groups of objects separated by one attribute. I can make up yes/no questions about these groups. To identify the object attributes needed to collect relevant data.I can explain why it is helpful for a database to be well structured.I can compare the information shown in a pictogram with a branching database. | I can explain that data gathered can be used to answer a given question and I can suggest questions to be asked of the data. I can use a data logger to collect data and that the data logger collects ‘data points’ from sensors over a given time. I can use collected data to answer questions and draw conclusions.  | I can create a database, using fields which hold and record the data. I can search a database using ‘and’ and ‘or.’ I can apply filters and select an appropriate chart or graph to visually compare data. I can apply my knowledge of a database to ask questions that will need more than one field to answer. | I can create a formula in a spreadsheet for simple conversions e.g. cm to m and use formulas to calculate the perimeter of a rectangle. I can work collaboratively to solve a problem using spreadsheets. I can use simple formulae to solve calculations including =sum and other statistical functions. I can present data visually using graphs in2calculate and/or Excel. I can decide which keys are more suitable to perform a task. E.g. Numerical keys when typing long numbers. |
| **VOCABULARY** |  | ObjectLabelGroupDataPropertiesClassify | PictogramTallyCountCompareAttributesBlock diagram | Tree structureBranching database | Data loggerData setData collectionSensorsData pointsData fileLogged data | RecordFieldDatabaseSortingGrouping | Data inputSpreadsheetCellCell formatProduce calculated dataFormulaCell referencesDuplicate |

| **Creating Media - Summer 1** |
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| **KNOWLEDGE** | **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
|  | I know how to use Microsoft Word. I know how to change the font and use bold, italic and underline. | I know how to edit more complex digital data such as music compositions. I know how to use a range of media in their digital content including photos, text and sound and present ideas. I know notes in music are arranged in a sequence. Changing the order changes the sound. | I know the importance of having a secure password and not sharing this with anyone else. I know that not all information on the internet is correct. I understand that there is more than one way to report unacceptable content and contact. I know that being on the internet or playing games can alter my emotions. | I know I should report inappropriate content found online to a trusted adult. I understand that not all information I find online has been fact checked. I know that malware is software that is specifically designed to disrupt, damage, or gain access to a computer. I know what a computer virus is. I know it is healthy to limit screen time and have sceen free activities. | I understand the difference between online misinformation (inaccurate information distributed by accident) and dis-information (inaccurate information deliberately distributed and intended to mislead). I have a secure knowledge of common online safety rules and can apply this by demonstrating the safe and respectful use of a few different technologies and online services. I know how to relate appropriate online behaviour to their right to personal privacy and mental wellbeing of themselves and others. |  I know how to create a 3D object using a computer program. |
| **SKILLS** |  | I can find and identify keys on a key pad. I can use a computer to write I can add and remove text on a computer using the backspace key. I can change the look of the text by using bold, italic and underlining. I can make careful choices when changing text, for example, changing the font, selecting a word by double clicking or clicking and dragging. To explain why I used the tools that I chose. To compare writing on a computer with writing on paper. | I can listen to music, for longer periods of time, identifying differences in pieces and say how it makes me feel. I can create a rhythm pattern and follow a rhythm pattern on a percussion instrument. I can use a computer to experiment with pitch and duration.: I can use a computer to create a musical pattern using three notes, refining my pattern I can create and save a musical pattern to describe an animal. I can evaluate my work stating how I could improve it. I can reopen it. | I can recognise what a good password is and why I should keep passwords safe. I can explain what is meant by the term ‘online identity’. I can identify the age restrictions on games and apps to work out whether they are suitable for me. | I can identify possible risks of installing free and paid for software. I can identify signs of a computer virus. I can identify security symbols such as padlocks can help keep me safe online. I can identify and am aware of the existence of scam websites. I can explain what a digital footprint is and how it relates to identity theft. I can give examples of things that they would not want to be in their digital footprint. | I can explain how identity online can be copied, modified or altered. I can demonstrate responsible choices about my online identity, depending on context. I can refer to SMART choices. I can think critically about what I share online and the digital footprint I create. I can explain how I would report online bullying on the apps and platforms that I use and know how to block abusive users.I can describe the helpline services who can support me and what I would say and do if I needed their help (e.g., Childline) I can explain how and why some people may present ‘opinions’ as ‘facts’. I can define the terms ‘influence’, ‘manipulation’ and ‘persuasion’ and explain how I might encounter these online (e.g. advertising and ‘ad targeting’). I can explain key concepts including: fact, opinion belief, true, false, valid, reliable. |  I can use a computer to create and manipulate three-dimensional (3D) digital objects.I can compare working digitally with 2D and 3D graphics.I can construct a digital 3D model of a physical object.I can identify that physical objects can be broken down into a collection of 3D shapes.I can design a digital model by combining 3D objects.I can develop and improve a digital 3D model. |
| **VOCABULARY** |  | Word processorKeysSpaceBackspaceCaps LockBoldItalicUnderlineDouble clickFont Undo | Rhythm Rhythm patternPitchMusical patternSequence of notes | Adobe spartText ImageDesktop publishingReturnShiftTemplatePage orientationPlace holderLayout  | Rotate CropFilterColour effect CloningPhoto retouchDuplicateCombined image | VectorVector drawingAlignment gridResize handleZoom toolLayersDuplicate (images)Group and ungroup (images) | 3D modelThree dimensionsLiftLowerWorkplaneRecolourPlaceholders |

| **Programming B – Summer 2** |
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| **KNOWLEDGE** | **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
|  | I know that an algorithm is a set of instructions used to achieve an objective. I know that an algorithm written for a computer is called a program and finding errors in an algorithm is called debugging.  |  I know how write and algorithm to my design. I know how to debug and improve my design. | I know how to make my sprite move and I can select keys to do this (up, down, left, right) I know how to add blocks and use function such as pen down. | I know how to add loops to a program. | I know how to use scratch to create a quiz. I know how to add a loop. | I know how to control multiple variables on a physical computing device. |
| **SKILLS** |  | I can compare different programming tools and find and use commands to move a sprite. I can use a start block in a program and I can join blocks together. I can explain what happens when I change a value. I can add blocks to my sprite and delete a sprite. I can create an algorithm for each sprite to control movement. I can test the programs I have created and alter my designs.  | I can identify that a program needs to be started and I can identify the start of a sequence. I can change the outcome of a sequence of commands; can match two sequences with the same outcome and predict an outcome. I can create a design and decide which blocks I need, which background I will use and choose characters. I can create an algorithm, debug and improve by adding features. | I can explain how a sprite moves in an existing project.I can create a program to move a sprite in four directions.I can adapt a program to a new context.I can develop my program by adding features I can identify and fix bugs in a program.I can design and create a maze-based challenge. | I develop the use of count-controlled loops in a different programming environment, for example scratch. I can explain that in programming there are infinite loops and count controlled loops. I can develop a program which includes two or more loops which run at the same time. I can modify an infinite loop. | I can explain how selection is used in a program and identify conditions and how to modify them. I can create a program with different outcomes using selection and identify the condition and outcome is an if… then… else statement. I can explain how selection directs the flow of a program.I can design and create a program which uses selection: creating the algorithms, running the program and debugging.  | I can create a program to run on a controllable device.I can explain that selection can control the flow of a program.I can update a variable with a user input.I can use a conditional statement to compare a variable to a value.I can design a project that uses inputs and outputs on a controllable device.I can develop a program to use inputs and outputs on a controllable device. |
| **VOCABULARY** |  | SpriteProgramming Start blockAlgorithmValueProgramming areaProgramming blockAnimation | Green flag (Within scratch Jr.)BackgroundModifyDebug  | EventActionCodeProgramming extensionPen extensionPen down blockBugsDebugging OutcomePen trailSet up block | Count-controlled loopLoopSnippet of codeInfinite loopEvent blockCode blocks | Conditions‘if...then...else’ structureProgram flowBranching structureSetup code | Micro:bitInput, process, output deviceEmulatorControllable deviceSelectionAccelerometerOperand  |