**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** |  | Technology  Desktop  Laptop  Computer  Mouse  Trackpad  Login  Username  Password  Keyboard  Edit  Spacebar | Information technology  Device  *Examples of IT- Barcode scanner, printer, tablet, chip and pin machine, card reader* | Input  Process  Output  Network  Network components  Server  Wireless Access Point  Network switch | Router  World Wide Web  Online content | Digital system  Physical connection  Electronic connection  Computer system  Search engine  Rank  Web search  Web crawler  Seach engine index  Content creator | Web address  IP address  Domain Name Server (DNS)  Data packet  Header  Data payload  Copyright  Internet communication  Internet collaboration  Security  Privacy |

| **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, line  undo  Save  Retrieve | Capture  Digital photograph  Portrait  Landscape  Format  Photography composition  Retake  Artificial light  Natural light  Camera focus  Effects  Edit  Adjust | Animation  Frame  Stop-frame animation  Story board  Sequence of frames  Onion skinning | Input device  Output device  Microphone  Copyright  Recording  Podcast  Soundwave view  ‘Trim’ recording  Import  Align  Layers (in recording)  Sound effect  Background music  Audio file | Visual media  Store  Retrieve  Export  Reshoot | HTML code  Web layout  Copyright  Copyright-free  Fair use  Navigation path  Hyperlink  User 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 to  follow 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 blocks  I 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** |  | Robot  Direction  Command  Sequence  Predict  Program  Run | Outcome  Algorithm  Execute (run) | Scratch  Backdrop  Code  Motion block  Event block  Motion  Stage | Logo (website used)  Logo command  Code snippet  Repeat  Loop  Count controlled loop  Decompose/ decomposition  Procedures | Crumble controller  Programming environment  Circuit  Microcontroller  Crumble  Sparkle  Component  Infinite loop  Count-controlled loop  Condition  Conditional loop  Selection  Action | Variable  Program variable  Value |

| **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** |  | Object  Label  Group  Data  Properties  Classify | Pictogram  Tally  Count  Compare  Attributes  Block diagram | Tree structure  Branching database | Data logger  Data set  Data collection  Sensors  Data points  Data file  Logged data | Record  Field  Database  Sorting  Grouping | Data input  Spreadsheet  Cell  Cell format  Produce calculated data  Formula  Cell references  Duplicate |

| **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 processor  Keys  Space  Backspace  Caps Lock  Bold  Italic  Underline  Double click  Font  Undo | Rhythm  Rhythm pattern  Pitch  Musical pattern  Sequence of notes | Adobe spart  Text  Image  Desktop publishing  Return  Shift  Template  Page orientation  Place holder  Layout | Rotate  Crop  Filter  Colour effect  Cloning  Photo retouch  Duplicate  Combined image | Vector  Vector drawing  Alignment grid  Resize handle  Zoom tool  Layers  Duplicate (images)  Group and ungroup (images) | 3D model  Three dimensions  Lift  Lower  Workplane  Recolour  Placeholders |

| **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** |  | Sprite  Programming  Start block  Algorithm  Value  Programming area  Programming block  Animation | Green flag (Within scratch Jr.)  Background  Modify  Debug | Event  Action  Code  Programming extension  Pen extension  Pen down block  Bugs  Debugging  Outcome  Pen trail  Set up block | Count-controlled loop  Loop  Snippet of code  Infinite loop  Event block  Code blocks | Conditions  ‘if...then...else’ structure  Program flow  Branching structure  Setup code | Micro:bit  Input, process, output device  Emulator  Controllable device  Selection  Accelerometer  Operand |