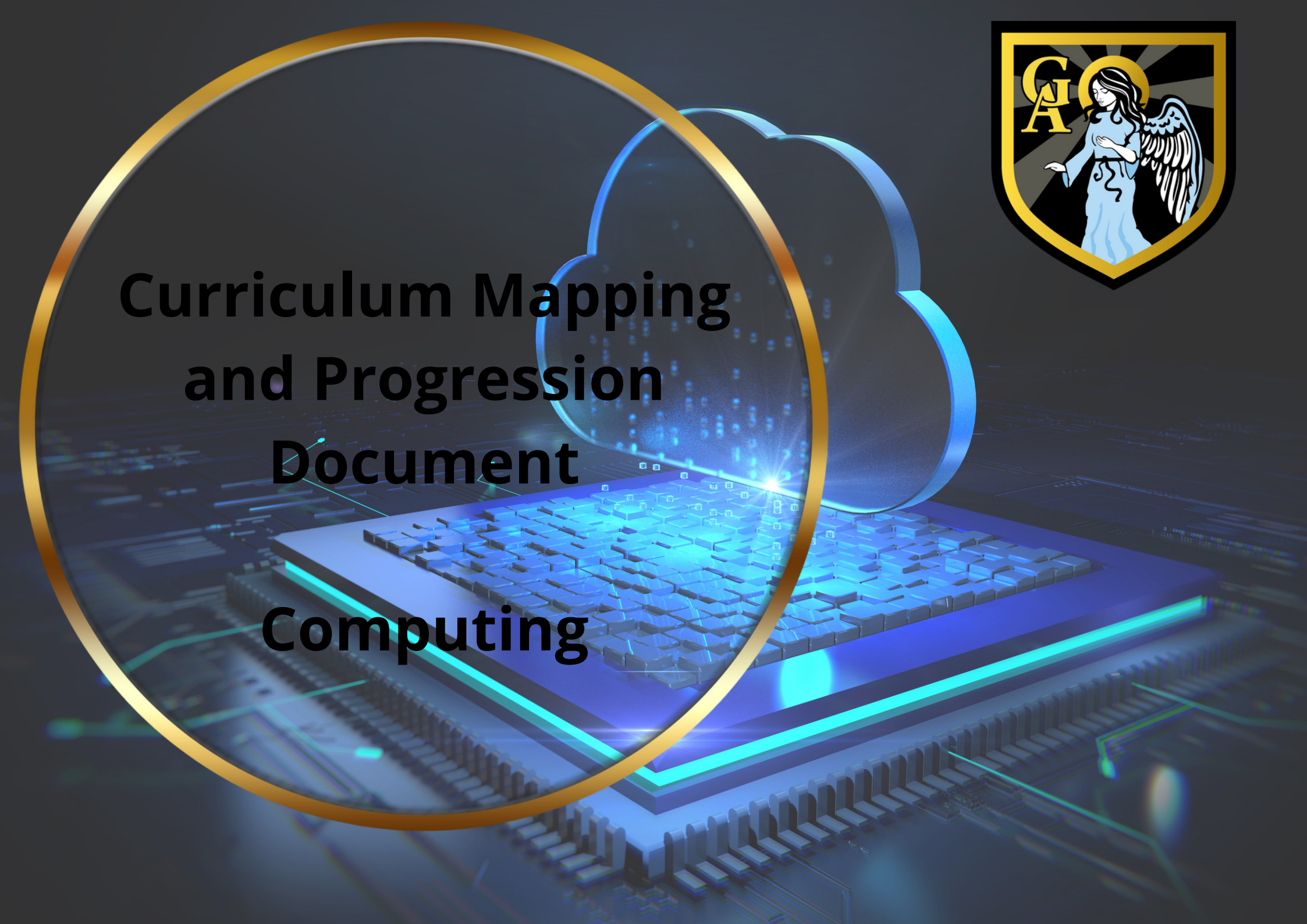

Curriculum Mapping and Progression Document

Computing

Vision for Computing

Our Computing curriculum addresses the challenges and opportunities offered by the technologically rich world in which we live. We use computing to enrich our curriculum across the key stages and ensure coverage of the national curriculum expectations. Following a clear progression of skills throughout the school, there are opportunities for children to solve problems, create online games and create videos.

Our Computing Curriculum Will Enable Pupils to:

- Use and express and develop their ideas through, information and communication technology
- Create simple algorithms and programmes
- Debug programming errors
- Create, store, manipulate and retrieve digital content using a mixture of word processing, paint packages, digital photography and video packages
- Be aware of their responsibilities online and know what to do if they have any concerns
- Know how information is stored on computers and how it travels, connecting people across the world through the use of the World Wide Web
- Explain their thinking behind their programmes
- Explore how search engines work
- Consider how their online actions can impact on others
- Know when and how to report an online concern
- Create computer games
- Use technology safely and respectfully
- Use logical reasoning to predict the behaviour of simple programs
- Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

Intent

The goal of the computing curriculum at Guardian Angels Catholic Primary School is to provide our children with vital skills that will follow them to their adult life. Our aim is to help children become capable users of technology. This entails providing them with the skillset to use technology to aid their lives socially, in their education, and – eventually – the workplace.

As well as our children becoming adept technology users and becoming responsible digital citizens, we want to encourage our children to understand that computing involves far more than just computers. We want them to understand that, through computational thinking, they can develop their creativity, become better at problem-solving through abstraction and become critical thinkers.

Computing in the Early Years Foundation Stage

EYFS	Development Matters 3&4 Years will learn to:	Development Matters Children in Reception will learn to:	Statutory Framework Early Learning Goals
Personal, Social and Emotional Development	Remember rules without needing an adult to remind them.	Show resilience and perseverance in the face of a challenge. Know and talk about the different factors that support their overall health and wellbeing: -sensible amounts of 'screen time'.	Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. Explain the reasons for rules, know right from wrong and try to behave accordingly.
Physical Development	Match their developing physical skills to tasks and activities in the setting.	Develop their small motor skills so that they can use a range of tools competently, safely and confidently.	
Expressive Arts and Design		Explore, use and refine a variety of artistic effects to express their ideas and feelings.	Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.
Understanding the world	Explore how things work.		
Topics	**Autumn** **Who is a good friend?** **Once upon a time**	**Spring** **What happens when we are asleep?** **Ready, Steady, Grow**	**Summer** **Are we there yet?** **Fun in the sun!**

Computing and the National Curriculum

	Key Stage 1	Key Stage 2
Computer Science and Programming	Understand what algorithms are: how they are implemented as programs on digital devices: and that programs execute by following precise and unambiguous instructions Create and debug simple programs Use logical reasoning to predict the behaviour of simple programs	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems: solve problems by decomposing them into smaller parts Use sequence, selection, and repetition in programs: work with variables and various forms of input and output Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs Understand computer networks including the internet: how they can provide multiple services, such as the World Wide Web Appreciate how [search] results are selected and ranked
Information Technology - Data Handling, Databases and Spreadsheets	Use technology purposefully to create, organise, store, manipulate and retrieve digital content	Use search technologies effectively Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
Information Technology - Collecting, Evaluating and Presenting Information	Use technology purposefully to create, organise, store, manipulate and retrieve digital content	Use search technologies effectively Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
Digital Literacy – Education for a Connected World framework and Project Evolve Toolkit	Recognise common uses of information technology beyond school Use technology safely and respectfully, keeping personal information private: identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies	Understand the opportunities [networks] offer for communication and collaboration Be discerning in evaluating digital content Use technology safely, respectfully and responsibly: recognise acceptable/unacceptable behaviour: identify a range of ways to report concerns about content and contact

Expected End Points in Computing

	Information Technology - Handling data, databases and spreadsheets	Information Technology – Collecting, evaluating and presenting information	Programming and Computer Science
By the end of KS1	• Ask questions and collect data for a specific purpose. • Construct simple tally charts, tables, charts and pictograms. • Ask and answer simple questions from data displayed in simple tally charts, tables, charts and pictograms about totalling and comparing data.	• Create a range of digital content using software under the control of the teacher that includes word processing, creating pictures using a paint package, taking and manipulating digital photographs and video, including animation. • Store, organise and retrieve digital content – save a file, know where the file is saved and open it, organise files in a workspace. • Combine content from different sources (word processing, paint, photos/video/animation and • charts) to create a digital portfolio (J2Mix) Recognise common uses of technology beyond school	• Use logical reasoning to predict the behaviour of simple programs using route-based programming. • Know what an algorithm is. Write and debug simple programs showing an understanding of sequencing, with help from the teacher, using simple movements for a floor turtle and an onscreen turtle/sprite. •

Expected Endpoints in Computing

	Information Technology - Handling data, databases and spreadsheets	Information Technology – Collecting, evaluating and presenting information	Programming and Computer Science
By the end of LKS2	• Ask questions to organise and sort data into groups or to classify things. • Gather, record and present data in a simple database to help in answering questions. • Use sort and search techniques to locate data in a simple database based on specific criteria. • Interpret and present discrete and continuous data in charts and graphs.	• Create a range of digital content using software with increasing independence that includes word processing, creating pictures using a paint package, animation, multimedia including sound, video and hyperlinks to present content. • Store, organise and retrieve digital content – save a file, know where the file is saved and open it, organise files in a workspace.	• Begin to use logical reasoning to explain how simple algorithms and programs work. • Independently detect errors in algorithms and programs using block-based programming and correct errors with support. • Know the difference between an algorithm and a program. • Write new or modify algorithms and programs with increasing independence, showing an awareness of sequencing, inputs, outputs, and repetition. • Identify patterns in instructions to begin using repetition for count controlled loops and indefinite loops including nested loops. Begin to use selection 'if... then' and repetition using condition loops. • Begin to show an awareness of how data is stored in a computer's memory as a bit using either a 1 or 0 symbol. • Know how RAM is used by the CPU to process data. • Know that 8 bits makes a byte and decode bytes using ASCII Code. • Create binary images.

Expected Endpoints in Computing

	Information Technology - Handling data, databases and spreadsheets	Information Technology – Collecting, evaluating and presenting information	Programming and Computer Science
By the end of UKS2	• Complete, read and interpret information in spreadsheets. • Use data presented in spreadsheets through constructing formulae to solve problems or model outcomes to ask and explore 'what if' questions. • Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	• Create a range of digital content using software with increasing independence that includes word processing, animation, multimedia including sound, video and hyperlinks to present content. • Show an awareness of audience and purpose when presenting content through careful choice of layout, colours, images, sound and overall content to convey appropriate meanings and styles. • Use a range of digital technologies to communicate and collaborate with one another in real time, understanding that different technologies work with different-sized groups and know when one method is more appropriate to use compared to another. • Are aware that terms and conditions of services do apply to them and recognise acceptable and unacceptable behaviour. • Show an awareness of being discerning in evaluating digital content. • Show an awareness of their own digital footprint and how data is collected and used by companies online. • Show an awareness of the implications and capabilities of artificial intelligence and machine learning technology. • Know how Big Data, the Internet of Things and Artificial Intelligence technologies gather data from connected devices. This data is used by businesses within their key processes and daily tasks, assisting new developments in technology moving towards a 'smart' and more efficient society.	• Use logical reasoning to explain how simple algorithms and programs work. • Independently detect and correct errors in algorithms and programs using block-based programming. Use decomposition to solve complex problems. • Know that there is more than one way to solve a problem through programming and effectively select the most efficient method. Use sequence, repetition, and selection with increasing • confidence. Developing selection from 'if…then' to 'if…then…else' and integrate into loops and nested loops where appropriate. Understand and use variables in code.Know when to use a placeholder variable or a variable to store and change numbers in code. • Understand what the internet is, how it provides a variety of services to networked computers and how data travels as packets from one computer to another. • Show an awareness of how search engines work in relation to page ranking and algorithms. • Be discerning in evaluating digital content with an awareness of fake news

Information Technology Progression for Data Handling, Databases and Spreadsheets Unit Overviews

Key Stage 1		Key Stage 2			
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Gathering data and creating charts Create charts using JIT 'Chart' and 'Pictogram' tools. Develop an understanding of interpreting data from a chart using JIT 'Mix' to present work.	**Collecting, organising, and presenting data** Develop a better understanding of interpreting data from a chart – using JIT 'Chart' and 'Pictogram' tools. Gather opinions using the j2vote software and present the findings.	**Creating a branching database and interrogating simple databases** Understand what a database is and how frequently we use them in life. Use JiT Branch to create and use a branching database, focusing on questions to ask to uniquely identify objects/people. Use j2Data to interrogate a simple database. Create a j2e5 file to evidence screen captures of the searches and to reflect on learning.	**Creating and interrogating simple databases** Discuss how information is collected and organised for use in a database. Design a database, considering audience and purpose. Interrogate data contained within a database using the sort and search functions.	**Creating and using spreadsheets as models to solve problems** Use and create spreadsheets to support solving mathematical problems, use simple formulae to carry out calculations and answering what if type questions. Present information in the form of graphs where required.	**Analyse and interpret data using spreadsheets** Create spreadsheets that are fit for purpose and support the user in finding the answers to problems by modelling real life situations. Consider layout options to improve the user experience and create complex formula, that uses brackets, to carry out two step calculations.

Information Technology Progression for Collecting, Evaluating and Presenting Information Unit Overviews

Key Stage 1		Key Stage 2			
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Just Paint and Write – Part 1 - All about Me Children will create a number of drawings and text files, save them and then use them in a JiT5 'Write' and 'Paint' software to produce pieces of work entitled' All about Me'	**Ways to Present Information** Design assets using JiT5 'Paint', 'Write' and 'Animate' tools	**Organising, Creating and Presenting** Use 3 types of multi-media: text, image and animation to create, organise and present content effectively, considering layout choices and appropriate presentation styles depending on purpose	**Multimedia Fact File** Create a researched based fact file based upon a topic being studied (Rainforest). Plan and create fact files pages that are hyperlinked from the home page include a range of multimedia – images, sounds, images and video	**Infographics** Develop an understanding of what makes infographics a popular choice to present and share information. Develop an understanding of colour, styling, enhanced editing tools and the use of charts/graphs/tables to effectively present information. They will research and select key information to present as an infographic in J2e5	**Understanding Big Data** This unit will look at what big data is, the impact on privacy and security of data, how data is used by others in both authorised and unauthorised ways
Collect Photographs and Paint Pictures – Part 2 Create digital album using Photographs, JIT5 'Write, 'Paint' and 'Mix' tools	**Art of Animation** Design animations that present information about oceans. Each lesson assets will be drawn using JIT5 'Paint' as well as adding backgrounds and shared images to combine and create an effective animation	**QR Codes** Explore what QR codes are and how they are created to present information to a user. Children will record sound files and create QR codes to allow others to access and listen to the sound file			**Artificial Intelligence and Machine Learning** Explore real world applications that use Artificial Intelligence (AI) and Machine Learning (ML) and reflect on its potential for the future of different industries and job roles that may not yet exist. Students will learn how to create their own Smart Classroom
	Create a Topic-Based eBook Use JiT tools to create an eBook in Jit Mix tool – include a mixture of text, painting and photos within a variety of page layouts				

Computer Science and Programming Progression Unit Overviews

Key Stage 1		Key Stage 2			
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Simple algorithms and programs part 1 Demonstrate logical thinking to support algorithmic thinking, prediction and debugging. Encode algorithms to a program to control a floor turtle. Activity types are unplugged and physical computing.	**Sequencing simple algorithms and programs** Sequences are the main logical structure of algorithms or programs. Children will predict and investigate route-based programs to answer numerous challenges. Some of the tasks will require the children to modify route-based programs and make their own route-based programs.	**Write a program part 1 – block-based sequences** This unit will look at debugging sequences of code. Use j2Code tool 'Visual' to create a scene with two characters having a conversation/telling a joke.	**Scratch Programming – from algorithm to code** This unit will use Scratch 3. Pupils will use various inputs and output to make this move, change size or play sounds. They will also learn how to use 'broadcast' as a conditional input.	**Programming Making Games** Develop logical thinking and coding using Scratch 3 to make a range of computer games.	**Game Design** Using Scratch 3 to effectively plan, design, and build complex code that uses pseudocode, cloning and conditional operators (Boolean).
Create simple programs part 2 Use logical thinking to evaluate algorithms and route-based programs to improve outcomes.		**Write a program part 2 drawing shapes** Complete some 'unplugged activities' (activities without a computer) to improve concepts of debugging, logical reasoning. Use j2Code tool 'Visual'. Create the code in Visual to draw simple shapes and patterns. Introduce pupils to repetition in code.	**On the Move with Programming** Using Scratch 3 to introduce movement blocks to animate sprites, changing backgrounds and using conditional statements If..Then.. Reinforcing sequence, repetition, and selection in programming.		**The Internet and World Wide Web** Understand what the internet is and discuss the services it provides. Focus in on the world wide web as a service and how data and information travels around the network. Consider how search engines help to find information and how to improve search techniques when looking for information online.
			What is Computer Technology? Looks at computers to understand what a	**Computers for Communication and Collaboration**	
			computer is made up of, how the components all work together to provide access to the technology we use today.	How computers offer opportunities for communication and collaboration; considering how technology has improved and forms of communication have changed as a result. Who has been influential in the changes of technology over time?	

Year 1 Skills Progression in Computing

Collecting, Evaluating and Presenting Information		Data Handling	Computer Science and Programming	
Just Paint and Write Pt 1 – All About Me	**Collect Photographs and Paint Pictures – Pt 2**	**Gathering Data and Creating Charts**	**Simple Algorithms and Programs Pt 1**	**Create Simple Programs Pt 2**
Use a range of tools within paint - change the brush size, colour, and texture to draw pictures. Know how to clear a mistake. Save as a paint file, an image, and stamp Become familiar with typing on a keyboard and begin to use simple tools to change the appearance of the text. Upload an image as a background Independently use paint tools, including adding relevant stamps, to build up a picture Know how to add a text stamp and customise the text before adding to the paint file With increasing independence, type on the keyboard and begin to use simple tools to change the appearance of the text. Upload an image as a background	With increasing independence, type on the keyboard and begin to use simple tools to change the appearance of the text. Upload an image as a background Know what makes a good photograph composition and how to use a digital camera to take a photograph. Compose and capture own photographs Independently use a range of tools within paint – change the brush size, colour and texture to draw pictures. Know how to clear a mistake Know that photographs can be changed after taking them using image editing tools to change the colour effect and overall appearance of an image Create a compilation of work and explain the tools used to create each piece of work	Know what the term data means and how we can collect data and present it in the form of a tally chart and pictogram Collect data to create a tally chart. Use the chart to create a pictogram and explain what the pictogram shows by interpreting the data Gather data and present as a pictogram. Know that data can be represented in other ways than using a tally chart or pictogram. Use the pictogram to create a block chart	To understand, write and execute an algorithm, debugging where necessary To understand what sequence means and to follow an algorithm in order Understand how to control a floor-based robot, write an algorithm and convert to code using route-based programming Use logical thinking to predict the position of a floor robot whilst creating a route-based program that achieves a specific outcome. During execution, debug code where necessary	To give precise instructions and follow instructions given to achieve a specific outcome Use logical thinking to predict the position of a floor robot whilst creating a route-based program that achieves a specific outcome. During execution, debug code where necessary Create and debug simple programs to control an onscreen sprite using route-based programming to achieve a specific outcome Create and debug simple programs to control an onscreen sprite using route-based programming to achieve a specific outcome. Use logical thinking to evaluate and improve the program

Year 2 Skills Progression in Computing

Collecting, Evaluating and Presenting Information			Data Handling	Computer Science and Programming
Ways to Present Information	**Art of Animation**	**Create a Topic-Based eBook**	**Collecting, organising and presenting data**	**Sequencing simple algorithms and programs**
Search for appropriate images online and use paint tools to create additional features to design a digital picture that tells/explains a specific story or process Use digital pictures created as backgrounds for writing. Use the mouse cursor to select text then use text editing tools to change the appearance of the text Know that animation is another method to present information. Create multiple frames that contain images with each image being slightly different from the previous one	Upload an image from shared files to a paint file and use the fill tool to add colour to certain areas of the image. Save as a paint file and as an image Upload image saved to animate, duplicate frames and add ABC.. stamps to particular frames, using them as labels to identify the continents and oceans, making sure that the frames last long enough for the information to be read before moving on to the next labelled frame Create a paint project and use a variety of tools to create a scene and save as a paint file and an image Create individual paint projects and use a variety of tools to create objects related to the scene and save each one as a paint file and stamp Create an animation using onion skinning as the technique when working on the next frame to show movement. Upload the image of the scene as a background, stamps created in Paint and stamps saved in shared files to tell a story	Make appropriate choices on the layout and presentation of a title page. Include an image – either digital photo or a drawing and add text Use digital pictures as backgrounds for writing. Use the mouse cursor to select text then use text editing tools to change the appearance of the text Use paint and write programs to design and create content, making use of the various tools to produce paint files, stamps and write files. Combine work in a digital portfolio	Know what a multiple-choice question is and why they are a good way of collecting data from lots of people. Answer multiple-choice questions for the purpose of collecting data Know that there are other ways to gather data by asking questions that are not multiple-choice by using yes/no questions. Design multiple-choice questions and yes/no questions to gather data To create charts from information in tally tables and interpret the data from the chart Know what characteristics are and how to use them to sort groups of objects by using yes/no questions. Use a branching database to answer questions Mistakes can be made when collecting and organising data. If the mistakes are not found it makes the data unreliable	Provide clear and precise verbal instructions in a sequence for another person to listen carefully to and follow to complete a given task. Begin to use logical reasoning to predict outcomes to design a program to control movement Use logical reasoning to follow a program and identify what the outcome will be and compare the prediction to the program outcome Using logical reasoning to predict outcomes, identify specific instructions within a program that need to be changed and replace with new instructions that will achieve the required outcome Create algorithms and programs using a set number of commands to achieve specific outcomes Follow a program in reverse to predict the starting position from a given finish position

Year 3 Skills Progression in Computing

Collecting, Evaluating and Presenting Information		Data Handling	Computer Science and Programming	
Organising, Creating and Presenting Know how to add text, borders, and images, making appropriate choices regarding position, size, colour and theme Know how to present work clearly and for appeal/interest. Use tools to layer and arrange images and text that can be clearly read/seen Take photographs and mask the background to make the image transparent. Upload and layer onto other images Create an animation using onion skinning technique and save as a GIF. Embed the GIF into another document	**QR Codes** Create QR codes using a QR code generator. Understand how the QR code links to the location of where the information is stored Scan QR Codes to access information easily. Understand that each QR code is unique and can only link to one location/information source Record an audio file and create a QR code to share its location with others Create QR codes that link to different media e.g. websites, audio files, notes to provide easily accessible information	**Creating a branching database and interrogating simple databases** Know what characteristics are and how to use them to sort groups of objects by using yes/no questions. Use a branching database to answer questions Know that yes/no questions need to be ordered carefully when grouping objects to create the structure for a branching database Know the term 'database' and how they are used to store and organise data using key characteristics Use tools within a database to order and answer questions about the data using simple searches Develop search techniques to match data from more than one field using 'AND' and 'OR' to refine results Know that a database may contain errors and can affect search results	**Write a program part 1 – block-based sequences** Decompose a task into smaller parts and give precise instructions in sequence to complete a task Know how to use block-based programming, using Motion blocks, to move a sprite forward and backwards Read and follow a block-based program to identify and correct errors that prevent the desired outcome from being achieved Use Look blocks in sequence using block-based programming and specify a time to display the look before changing to another look block command Use delay commands from the Control blocks to structure the sequence to achieve the desired timing outcomes Identify inputs and outputs within a program. Use inputs to trigger events within the code	**Write a program part 2 drawing shapes** Use logical reasoning to follow and give precise instructions, including identifying errors and correcting them Use sequencing to create algorithms and identify patterns when drawing a simple polygon. Make the algorithm more efficient by using repetition where patterns have been identified. Encode algorithm to block based programming Use sequencing to create algorithms and identify patterns when drawing a more complex polygon. Make the algorithm more efficient by using repetition where patterns have been identified. Encode algorithm to block based programming Use coding blocks that draw single polygons and embed these within a nested loop to extend the use of repetition to draw repeated shape patterns

Year 4 Skills Progression in Computing

Collecting, Evaluating and Presenting Information	Data Handling	Computer Science and Programming		
Multimedia Fact File To know how to present information on a page using text and images. Plan a non-linear presentation, making appropriate choices for layout and content to present the information clearly. Be aware of copyright issues surrounding the use of images online To know and use different ways of presenting information to make the content more engaging and accessible through the use of sound files and embedded videos Create multiple pages for their presentation and use hyperlinks to link them together as detailed in their planning to create a non-linear presentation	**Creating and interrogating simple databases** To locate data organised in a paper-based record card database, identifying fields and data to answer specific questions Design a questionnaire using a range of data types and open and closed questions to gather useful data that is fit for purpose to solve a given problem Use an electronic database to look at how data can be recorded. Enter data to create records under appropriate field names Use an electronic database to examine how data can be viewed, sorted and searched for Create and use charts to visually compare data and answer questions about it	**Scratch Programming – from algorithm to code** Edit a sprites costume using the drawing tools and create a program using block-based coding to change the costumes of the sprite using the Looks command blocks and a loop and delay from the Control command blocks Programme several sprites that each have a different Event block that controls the start of each program. Include a variety of Looks and Motion command blocks to change the appearance and position of each of the sprites, using Control command blocks to delay between changes where necessary Programme several sprites that each have a variety of Looks and Music command blocks to change the appearance and audio played for each sprite. Include two forms of repetition from the Control command blocks – a count-controlled loop and a continuous loop to control the number of iterations that occur To use broadcasting as a method to direct the timing of events within code to trigger a script to run	**On the Move with Programming** Control a sprite to move on the stage. Adding code so a sprite will go to an exact position on the stage Control a sprite to move with the mouse pointer Control a sprite to move using the arrow keys, changing costumes and the direction that the sprite faces to improve the aesthetics of movement Know that when selection/conditional statements if…then…are used a decision is made based on inputs received that determine which output is achieved Design and create a simple maze game that includes controlling the movement of a sprite with the mouse or arrows keys, using selection to detect maze walls/objects that trigger another event	**What is Computer Technology?** To understand what a computer is and to know the difference between hardware and software, and to differentiate between input and output devices To understand what the main parts of a computer are called and what their function is Know where and how internal components of a computer, such as the CPU, RAM and hard drive are located and how they work together to process and store data Know how data is stored and processed as binary digits in the form of bytes by the CPU and RAM. Use ASCII Code to decode bytes Know how simple binary image data is stored and processed by the CPU and RAM, and displayed on screen in the form of pixels Know that coloured images have more data per pixel than black and white images and they are saved as larger data files

Year 5 Skills Progression in Computing

Collecting, Evaluating and Presenting Information	Data Handling	Computer Science and Programming	
Infographics Know that an infographic is a creative way of presenting key information through text, images, tables, charts, and graphs Know how colour can be used to enhance ways of presenting information, making careful choices regarding legibility and the intended effect on mood and associations Make choices about the style of text and images to use. Understand about copyright issues on images and abide by licences Organise and present information in the style of an infographic	**Creating and using spreadsheets as models to solve problems** Organise data into columns and rows to create own data sets and apply formulae using cell references that include a range of cells to calculate data Use a spreadsheet to answer questions and identify that changing inputs will change the output of a calculation where formula is used Create a spreadsheet by organising data into columns and rows using appropriate headings and create simple formulae using the four basic maths operations (+, -, x and ÷) using cell references where appropriate to calculate the data to model and answer questions Create a spreadsheet by organising data into columns and rows using appropriate headings and create formulae, including minimum, maximum and average, using cell references to calculate the data Design a spreadsheet to model a real-life problem using appropriate formulae using cell references to calculate data. Create graphs to display data to evaluate results in comparison to the problem being modelled	**Programming Making Games** Use sequence, repetition, and selection to link and control the movement of one sprite with another when conditions are met using sensing blocks related to sprites or colours as an input Use sequence, repetition, and multiple selection blocks to control the movement of a sprite when conditions are met using a variety of keyboard keys as inputs to control a sprite Use sequence, repetition, and selection. Create own variables and include them within a program to keep track of a score Use sequence, repetition, and selection. Include the use of operators to allow for a range of values to be included under the selection/conditional blocks Use sequence, repetition, and selection to create procedures and sub procedures. Use procedures effectively, as part of abstraction, to help simplify complex code	**Computers for Communication and Collaboration** Know that the Internet is required to send an email and explain how email software works and what information is required to successfully send an email Know that the Internet is required to send instant or direct messages and explain how they are different to other lines of communication such as email Know that a wiki is designed for collaboration and can be edited by all users. Explain why being discerning in evaluating the content of a wiki is required when using it as a source of information

Year 6 Skills Progression in Computing

Collecting, Evaluating and Presenting Information		Data Handling	Computer Science and Programming	
Understanding Big Data	**Artificial Intelligence and Machine Learning**	**Analyse and interpret data using spreadsheets**	**Game Design**	**The Internet and World Wide Web**
Understand how our data can be actively and passively collected, stored, and used by others when we connect to the Internet Know that data can't be collected by companies without prior consent from the user. Understand the importance of terms and conditions and a user's 'choice' to allow data to be collected, stored, and shared Know how data can be accessed and used without user consent or knowledge through hacking. Understand that hacking is a criminal offence and ethical hacking is not Know that a cookie is used by websites to remember you, your preferences, and your habits online	Know how to be discerning in evaluating digital content showing an awareness of misinformation and disinformation Know how artificial intelligence and machine learning works using big data to learn from Understand artificial intelligence and machine learning and how it benefits others Using IBM Watson train a Smart Assistant to switch devices on/off e.g. a lamp and a fan using AI and ML	Create formulae using cell references, including a range of cells to produce calculated data Create formulae using the four basic maths functions (+, -, x, ÷) and cell addresses where appropriate, using brackets to order mathematical operations Apply appropriate number and text formats to cells. Remove and add data to a spreadsheet and adjust formulae where required. Use the spreadsheet model to answer questions that model real-life events Create a spreadsheet by organising data into columns and rows using appropriate headings and create simple formulae using the four basic maths operations (+, -, x and ÷) using cell references where appropriate to calculate the data to model and answer questions Add data to a pre-populated spreadsheet and use formulae, using cell addresses and cell ranges where appropriate to model real-life scenarios and answer questions	To know what Boolean Logic is and demonstrate how to use it with If Then Else blocks Use selection/conditional statements if…then…else. Include variables and operators to control conditions Create own variables and use cloning to make a copy of a sprite and its script which runs independently of the original. Include broadcasting to control events Use sequence, repetition, and selection to design a program to create a game that matches a design brief. Create a user manual for others to follow	To create a drawing and text that explains what the Internet and WWW are Know what is involved in the process of requesting information from the Internet, how it is received by relevant components and returned to the user's device Know how data is broken into packets to travel from one location to another on the Internet when requested Know how search engines work to index web pages and rank results returned to the user Know how to effectively use search terms and read the anatomy of a web address to find more accurate and relevant sources of information on the web