CRIGGLESTONE ST. JAMES CE PRIMARY ACADEMY

Computing

‘Ready for the Future’

2022-2024

Computing Overview												
	Autumn A		Spring A		Summer A		Autumn B		Spring B		Summer B	
EYFS	Marvellous me	Superheroes	Weather – Come outside	Once upon a time	Wonderful Minibeasts	Only One Earth	Marvellous me	Superheroes	Weather – Come outside	Once upon a time	Wonderful Minibeasts	Only One Earth
KS1	Technology around us laptops	Digital Painting laptops	Moving a robot Floor bots	Grouping data laptops	Digital writing laptops	Programming animations iPads	IT around us laptops	Digital photography iPads	Robot algorithms Floor bots	Pictograms laptops	Making music laptops	Programming quizzes iPads
LKS2	Connecting computers laptops	Stop frame animation iPads	Sequencing sounds iPads	Branching databases iPads	Desktop publishing laptops	Events and actions in programs laptops	The internet iPads	Audio editing laptops	Repetition in shapes iPads	Data logging Laptops Data loggers	Photo editing laptops	Repetition in games laptops
UKS2	Sharing information	Video editing	Selection in physical computing	Flat-file databases	Vector drawing	Selection in quizzes	Internet communicatio n	Webpage creation	Variables in games	Introduction to spreadsheets	3D modelling	Sensing

Blurb

At St James we believe that it is important that pupils have a high-quality computing education that focusses on computational thinking which enables children to find, explore, analyse, exchange and present information. The core of computing is computer science where children will be taught the principles of information and computation, how digital systems work and programming. Building on this knowledge, pupils will use information technology to create programs, systems and a range of content. We also ensure that our pupils become digitally literate and able to express themselves and develop their ideas through information and communication technology – to be ready, for their future, in an ever-increasing digital world.

Rationale of Progression Through School

Computer systems and networks

In EYFS children begin their technology journey in continuous provision. They explore technology linked to the real world around them such cameras, mobile phones and electric toys. As a challenge, adults facilitate open ended questions such as 'How do you press?' or 'What happens if?'. This helps to develop their problem-solving skills related to computing. Children will then be introduced to a keyboard and learn how to type their name. Building on from this, children will learn about the internet and explore…

In Key Stage 1, children will develop their understanding of technology and how it can help them. They will become more familiar with the different components of a computer by developing their keyboard and mouse skills, and also start to consider how to use technology responsibly. In addition, children will explore how information technology (IT) is being used in our lives.

In Lower Key Stage 2, children will be challenged to develop their understanding of digital devices, with an initial focus on inputs, processes and outputs. They will start by comparing digital and non-digital devices, before being introduced to computer network. Children will then apply their knowledge and understanding of networks, to understand the internet and that the World Wide Web is part of the internet.

In Upper Key Stage 2, children will develop their understanding of computer systems and explain the input, output and process of these systems. Children will also explore how data is transferred over the internet. Children will then look at how the internet facilitates online communication and collaboration. Finally, children will learn how to communicate responsibly by considering what should and should not be shared on the internet.

Data and information

In Key Stage 1, children are introduced to data and information by the concept of labelling and grouping objects based on their properties. Using this, children will present data graphically in pictograms.

In Lower Key Stage 2, children develop their understanding of attributes (properties) and begin to construct branching databases to displaying and retrieve information. Children will also build on the concept of answering questions with data. Finally, they will be introduced to data in tables and graphs and automatic data collection.

In Upper Key Stage 2, children will deeper their understanding of why and how information might be stored in a database, and look at how tools within a database can help us to answer questions about our data. It moves on to demonstrate how a database can help us display data visually, and how real-life databases can be used to help us solve problems. Children will also look at how to organise and modify data within spreadsheets.

Creating Media

In EYFS children will begin to learn how to record a video…

In Key Stage 1, children will explore the world of digital art and its exciting range of creative tools. Children will familiarise themselves with typing on a keyboard and begin using tools to change the look of their writing. In addition, children will learn to recognise that different devices can be used to capture photographs and will gain experience capturing, editing, and improving photos. Finally, children will explore how music can make them think and feel.

In Lower Key Stage 2, Children will use a range of techniques to create a stop-frame animation using tablets. Children will also become familiar with the terms 'text' and 'images' and understand that they can be used to communicate messages. They will use desktop publishing software and consider careful choices of font size, colour and type to edit and improve their own template for a magazine front cover. In addition, children will identify the input device (microphone) and output devices (speaker or headphones) required to work with sound digitally. In order to record audio themselves, children will use Audacity to produce a podcast. Finally, children will develop their understanding of how digital images can be changed and edited, and how they can then be resaved and reused.

In Upper Key Stage 2, children will have the opportunity to learn how to create short videos in groups where they will learn how to crop, edit and manipulate their videos. Children will also start to create vector drawings where they will learn how to use different drawing tools to help them create images. In addition, children will be introduced to the creation of websites for a chosen purpose. Children will identify what makes a good web page and use this information to design and evaluate their own website using Google Sites. Finally, children will develop their knowledge and understanding of using a computer to produce 3D models and evaluate their own 3D model of a building.

Programming

In EYFS children are introduced to programming where children will be introduced to Beebots and learn how to instruct them to move forwards, backwards, left and right.

In Key Stage 1, children will be introduced to early programming concepts. Children will explore using individual commands, both with other children and as part of a computer program. They will identify what each floor robot command does. Children are also introduced to the early stages of program design through the introduction of algorithms. Children will then develop their understanding of instructions in sequences and the use of logical reasoning to predict outcomes. Children will use given commands in different orders to investigate how the order affects the outcome. They will also learn about design in programming. They will develop artwork and test it for use in a program. They will design algorithms and then test those algorithms as programs and debug them. Children will then be introduced to on-screen programming through ScratchJr. Children will explore the way a project looks by investigating sprites and backgrounds. They will use programming blocks to use, modify, and create programs. Finally, children will begin to understand that sequences of commands have an outcome and make predictions based on their learning. They will use and modify designs to create their own quiz questions in ScratchJr and realise these designs in ScratchJr using blocks of code.

In Lower Key Stage 2, children will explore the concept of sequencing in programming through Scratch. They will be introduced to a selection of motion, sound, and event blocks which they will use to create their own programs, featuring sequences. The final project is to make a representation of a piano while applying stages of program design. Children will then explore the links between events and actions, whilst consolidating prior learning relating to sequencing. Children will begin by moving a sprite in four directions (up, down, left and right). They will then explore movement within the context of a maze, using design to choose an appropriately sized sprite. Children will be given the opportunity to draw lines with sprites and change the size and colour of lines. Children will design and code their own maze tracing program. Next, children will look at repetition and loops within programming. Children will create programs by planning, modifying, and testing commands to create shapes and patterns. They will use Logo, a text-based programming language. Finally, children will explore the concept of repetition in programming using the Scratch environment. It begins with a Scratch activity similar to that carried out in Logo in Programming unit A, where learners can discover similarities between two environments. Learners look at the difference between count-controlled and infinite loops, and use their knowledge to modify existing animations and games using repetition. Their final project is to design and create a game which uses repetition, applying stages of programming design throughout.

In Upper Key Stage 2, children will use physical computing to explore the concept of selection in programming through the use of the Crumble programming environment. Children will be introduced to a microcontroller (Crumble controller) and learn how to connect and program components (including output devices- LEDs and motors)

through the application of their existing programming knowledge. Children will be introduced to conditions as a means of controlling the flow of actions and make use of their knowledge of repetition and conditions when introduced to the concept of selection (through the if, then structure). Children develop their knowledge of selection by revisiting how conditions can be used in programs and then learning how the If… Then… Else structure can be used to select different outcomes depending on whether a condition is true or false. They will represent this understanding in algorithms and then by constructing programs using the Scratch programming environment. They will then use their knowledge of writing programs and using selection to control outcomes to design a quiz in response to a given task and implement it as a program. Next, children will explore the concept of variables in programming through games in Scratch.

Our intent is that our teaching of computing is …

To enable children to find, explore, analyse, exchange and present information. We also focus on developing the skills necessary for children to be able to use information in a selective and effective way. We want children to know more, remember more and understand more in computing so that they leave primary school computer literate. Computing skills are a major factor in enabling children to be confident, creative and independent learners and we identify opportunities where computing can support learning in others areas of the curriculum.

We intend to build a computing curriculum that develops pupil's learning and results in the gaining of knowledge of the world around them. We intend to ensure all pupils can understand and apply the fundamental principles and concepts of computer science, information technology and digital literacy.

We intend to build a computing curriculum that prepares pupils to live safely in an increasingly digital British society where pupils can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems.

The planning of learning always begins with the skills and knowledge that needs to be taught (knowledge organisers) and opportunities to apply learning are carefully designed.

Implementation

Computing will be taught as a discrete subject following the Teach Computing scheme to ensure lessons build on each unit of work will follow a sequence of carefully planned lessons which build on prior knowledge and skills. We believe that Computing should be delivered in a creative way and strive to inspire and engage children so that they can take ownership of their learning, providing links to the wider curriculum where possible and appropriate.

During lessons, children are exposed to high quality teaching and the necessary knowledge and vocabulary required to help them learn and develop their work through modelling and guided learning, building up to independent working. They are encouraged to be reflective learners as they build on learning and self and peer assess.

We also believe that learning about Computing should not stop outside of the classroom and encourage children to make links to the wider curriculum where possible so they might create a PowerPoint Presentation in RE or research using the internet in History or Geography.

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Computing Progression Grid

(Progression of skills, knowledge and vocabulary)

'Ready for the Future'

2022- 2024

EYFS Overview Year A & B						
	Autumn 2023		Spring 2024		Summer 2024	
Strand of Computing	Computing systems and networks			Programming	Creating Media	
Area	**Exploring technology**	**Introduction to the internet**	**Introduction to the keyboard**	**Introduction to Beebots**	**Taking photos and videos**	
Big question/ statement						
Outcome						
Substantive Knowledge	During continuous provision, children be introduced to a variety of different items of technology such as different phones, cameras, electronic toys an iPads.	Children will be introduced to the internet.	Children will be introduced to a keyboard and learn how to use this to write their name.	Children will be introduced to a Beebot and the language needed to move the Beebot forwards and backwards as well as turn left and right.	Children will independently take photos of the beans that they are growing. They will begin to learn how to record a video of another child in their class…	.
Vocabulary	Mobile Phone, camera, electronic toy	Internet, Google	Keyboard, keys	Beebot, forward, backward, left, right, turn	Record, film	

KS1 Overview YEAR A						
	Autumn 2022		Spring 2023		Summer 2023	
Strand of Computing	Computing systems and networks	Creating Media	Programming	Data and information	Creating Media	Programming
Area	**Technology around us**	**Digital painting**	**Moving a robot**	**Grouping data**	**Digital Writing**	**Programming animations**
Big question/ statement	What is technology?	You can't make art on a computer.	Robots do exactly what we tell them to do.	Can we sort data into groups?	Pencil or Keyboard?	What do algorithms do?
Outcome	Small piece of writing typed up.	Create own image in the style of an artist	Creating own program to test.	Answering questions about data.	(Wider curriculum based)	'Space race' project (ScratchJr)
Substantive Knowledge	Technology is something that has been made with a specific purpose to help other people. The key parts of a computer include; screen, base unit, mouse/trackpad and keyboard.	Paint app: The white area is the drawing space and the buttons at the top/side of the window are called tools, and they all have different jobs. To create a Mondrian-style	Robots are machines that can do tasks (robots can be specialised or multipurpose). The buttons on the bee bot tell it to do different things.	Objects have many different labels that can be used to put into groups. Computers can be used to group data for analysis.	A word processor allows us to types what we want to write instead of handwriting. The keyboard on a computer and laptop has different keys that do	Sprites are objects that can be programmed to do different things. Each sprite has its own programming area Programming blocks are used to modify and create

	Different computers use different mice, but they perform the same function. Writing on a keyboard is called typing. Typing is the process of using a keyboard to write words, letters or numbers on a screen. The save icon is used in lots of different programs.	picture in a painting program, an initial square is drawn and then divided into smaller shapes using straight lines. Painting tools in the digital painting program: paintbrush, pencil, fill tool, eraser, undo, shape tool, and brush styles if available	When you press go, the bee bot will complete the commands given. The Clear (X) button clears the robot's memory so that it forgets any instructions/buttons that were pressed before. The algorithm is explaining precisely where you want the robot to go (which the arrow cards support); this is then turned into 'code' by pressing the buttons. Fixing a program is called debugging.	An object can fit into more than one group depending on the context. Computers are not intelligent and require input from humans to perform tasks. Properties can be used to group objects. e.g. they can be grouped by colour or size. A label is a property used to describe an object, eg 'green'. This is the data that is collected about the object.	different things: letters, numbers and spacebar. The backspace key removes text. The caps lock key creates capital letters. The toolbar has different features to change parts of our writing: bold, italic, underline and font. When we double click a word it selects it so we can change the features using the toolbar. If we wanted to do all of the text, we click and drag. The undo button removes any previous changes.	programs (tell the computer what you want the sprite to do). The values under the blocks allows you to repeat the same the same block without using lots of the blocks. You can follow simple algorithms to create simple programs An algorithm explains precisely where you want the sprite to go. This is then turned into code by using programming blocks. When programming, there are four levels that can help describe a project, known as levels of abstraction. Task – what is needed Design – what it should do Code – how it is done Running the code – what it does.
Vocabulary	Technology, Mouse, Arrow, Keyboard, Typing, Text, Program, Safety	erase, fill, undo, shape tools, brush style	Programming, Command, Direction, Sequence, Debug	object, label, group, search, property, value, data set	word processor, curser, toolbar, bold, font, undo, redo, format	Command, Sprite, Blocks, Algorithms, Programs, Value Design

KS1 Overview YEAR B						
	Autumn 2023		Spring 2024		Summer 2024	
Strand of Computing	**Computing systems and networks**	**Creating media**	**Programming**	**Data and information**	**Creating media**	**Programming**
Area	**IT around us**	**Digital Photography**	**Robot algorithms**	**Pictograms**	**Making music**	**An introduction to quizzes**
Big question/ statement	How is IT being used for good in our lives?	Photographs are a representation of the real thing.	Instructions come in sequences.	When is it ok to share data?	Making music with a computer isn't the same as real instruments.	Sequence of commands allow you to predict an outcome.

Outcome	Class discussion on big question.	Their 'best' photograph applied with skills learnt	Design a mat and algorithm (WC based)	Collected data from class represented.	A music piece inspired by animals	Quiz question designs (ScratchJr)
Substantive Knowledge	IT includes: computers (PCs, laptops, tablets), devices made to work with computers (scanners, barcode scanners, printers, smart speakers). As technology continues to develop rapidly, some devices may fit in multiple categories. For example, a multifunction printer has a computer (processor) inside. It can work with a computer or independently. Technology can be found in shops and devices work together: Barcode scanner and till. Bank card, chip and PIN card reader, till. Traffic light, crossing button, crossing signal. Technology helps us in lots of different ways: It can save humans time, it can make it easier to keep records, it makes it easier to do jobs / school work in different places, it can help people do difficult jobs more quickly and accurately, it can hold lots of information, which humans might forget.	Photographs are images that have been captured with a camera. We should always ask permission before taking a photo of someone. A selfie is a photograph that a person takes of themselves. An action shot is a photo taken of a movement, such as jumping or waving. A portrait photograph is taller and is taken with the device held upright. A landscape photograph is wider and is taken with device held sideways. To prevent images turning out too dark, good photographers will check that there is enough light. If we move the camera whilst we take a picture, the camera can't focus so the image will turn out blurry. Photographers use different tools to edit their images and that editing simply means changing or correcting something, usually with the aim of making it better.	Computers can only follow the instructions that they are given. Instructions given to computers, as a program, must be clear and unambiguous. An algorithm is a precise set of instructions, which can be turned into code. Following an algorithm or program is called code tracing. When the corresponding buttons are pressed on the robot, it will create a program for it to follow. Debugging is finding and fixing errors in algorithms and progams. Decomposition is breaking a larger task into smaller chunks so it can be debugged.	You can count and compare objects using tally charts. Objects can be recognised as pictures and represented in a pictogram to compare data. Tally charts can be made into pictograms. Objects can be grouped by their attribute/property (colour, shape or size) Data from tally charts can be presented as block diagrams.	Chrome Music Lab allows you to create different rhythm patterns. On the Kandinsky page, you can experiment with your own sounds. Drawing lines at the top of the page (high pitch) and near the bottom (low pitch). To save work, the link will need to be copied and pasted onto a Word document, then saved in documents.	Sequences can be started in ScratchJr using the green flag. A sequence shows the order in which things happen. Programs in ScratchJr are read from left to right. This is the sequence of instructions. When you start the code, it runs in the order shown. All programs in ScratchJr need a block to start them. Explain that there are lots of different ways to start programs in ScratchJr, When programming, there are four levels that can help describe a project, known as levels of abstraction. Task – what is needed Design – what it should do Code – how it is done Running the code – what it does. ***Year 1s will need to be introduced to ScratchJr (lesson 1 is a recap)***

Vocabulary	Information Technology (IT), Computers, Devices, Environments, Workplace, Benefits, Safety, Rules, Responsibility	Capture, Photograph, Editing, Portrait, Landscape, Retake, Composition, Artificial, Autofocus	commands, instructions, debugging, algorithm, sequence	Pictogram, data, tally chart, attribute, block diagram	Rhythm, pattern, notes, tempo	Programming, Sequences, Outcomes, Animation, Design, Modify

LKS2 Overview YEAR A						
	Autumn 2022		Spring 2023		Summer 2023	
Strand of Computing:	**Computer systems and networks**	**Creating media**	**Programming**	**Data and information**	**Creating media**	**Programming**
Area:	**Connecting computers**	**Stop-frame animation**	**Sequence in music**	**Branching databases**	**Desktop Publishing**	**Events and actions**
Big question/ statement	How are we connected?	Can a picture move?	How do we sequence sounds?	Yes or no questions are the only way to sort objects.	Why is desktop publishing used in the real world?	How do we sequence events and actions?
Outcome	Assessment (Teach computing)	(Wider curriculum based) animation	A representation of a piano.	An identification tool using dinosaurs.	A magazine cover	A maze tracing program
Substantive Knowledge	A laptop has at least three inputs and three outputs. Devices can have one input that leads to several outputs Our world is filled with digital devices and tools. Digital devices are all forms of information technology, and that their purpose is to help us to complete certain tasks. The internet is a network of networks. A network switch manages the way in which data moves around a network. Network cables and network sockets are	There are many ways to make animations, e.g. using a pencil and paper, modelling clay, building bricks, etc. Animation means that we are making something that cannot move on its own look like it is moving, by taking a series of pictures and then showing them very quickly in sequence. To create an effective animation, we need to keep the iPad still, move gradually to create a smooth animation, onion skinning etc. Animations take a long time to produce; even a short clip can take a long time. Characters and	**Blocks palette:** The blocks build on those used in ScratchJr, with several additional functions. Highlight that there are more types of blocks, and explain that this lesson will focus on the motion blocks. **Code area:** This is where blocks are placed to create a program. Learners will do this for themselves following this slide. **Stage with sprite:** The output of the program is presented on the stage. By default the sprite is 'Scratch the cat' and the backdrop of the stage is blank. Learners will change the backdrop later in this lesson.	In computing, yes/no questions are important, as they are used in conditional statements in programming. Attribute is another way to say property Questions beginning with 'can it' could also be used in a branching database as they require yes or no answers. However, they are generally more ambiguous and as such, this unit focuses on using 'does it' and 'is it'. A branching database is a collection of data organised in a tree structure using yes/no or true/false questions. In computer	We see text and images used in lots of different ways in the world around us. Desktop publishing is a method of using page layout software to create documents that include both text and images and communicate massages or information, such as invitations, magazines or newsletters. Desktop publishing is called this because people used desktop computer. Now technology has improved, we can now create desktop publishing resources on a range of devices. Desktop publishing isn't limited to printed media,	Characters can be moved using 'events'. The Design stage, through the Coding stage, to Running the code. The design is given to learners in the form of a written algorithm. To move a sprite in four directions, their sprite will need four code snippets, which will be similar to each other. When the green flag is clicked, the project is set up to run again. A bug is an error in the design or the coding of the program, and the process of debugging is finding and fixing these errors.

	needed to connect devices in a network. The school network is connected to a **router.** The router provides a connection to the internet through an external cable.	backgrounds need to be kept the same to ensure consistency. By adding additional media to our animations, we can make them more appealing to the people watching them.	As well as controlling sprites with programming blocks, you can also change the appearance of a sprite using the costumes tab and add sounds from the sounds tab. When blocks are joined together, they create a sequence.	science, these are known as binary trees.	this page layout software is now used to make graphics for social media and other online content. Capital letters, exclamation and questions marks are made by using the shift button. A new line is to create by pressing the return key.	
Vocabulary	digital device, input, process, output, program, server, computer network, wireless access point, network hardware	Animation, Flip book, Still image, Motion Stop-frame, Storyboard, Onion skinning	programming, blocks, commands, code, sprite, motion, glide, sequence, event,	attribute, value, questions, table, objects, branching databases, separate	Template, Orientation, Placeholder, Font, Return, Backspace, Shift, Content, Publishing	Event, Action, Duplicate, Modify, Program, Code, Navigate, Command

LKS2 Overview YEAR B						
	Autumn 2023		Spring 2024		Summer 2024	
Strand of Computing	**Computer systems and networks**	**Creating media**	**Programming**	**Data and information**	**Creating media**	**Programming**
Area	**The internet**	**Audio editing**	**Repetition in shapes**	**Data Logging**	**Photo editing**	**Repetition in games**
Big question/ statement	What is the internet?	How do you create a podcast?	How do we use repetition and loops in programming?	How and why is data collected over time?	What is the impact of editing images?	How do we use repetition and loops in games?
Outcome	Assessment (Teach computing)	A podcast about school life	Design wrapping paper using more than one shape	An experiment to answer a question using the data loggers.	Create and publication for a book cover or poster.	Design and create a game using repetition.
Substantive Knowledge	In a network, computers are connected to a switch which passes messages around a network. Messages can also be passed from one network to another. For this to happen, another network component is needed — a router. A router literally 'routes' messages to their	Sound is recorded through and input device called a microphone – these can take various forms. You hear the sound produced through an output device (speakers). Some digital devices have built in microphones and speakers.	Repetition is where actions or commands in programming are repeated. The repeated commands can also be placed in to a loop. Loops can be repeated indefinitely, or a set number of times – the	We can use technology to automatically gather environmental data over time. It refers to data points and logging intervals. A data logger is a digital device that can collects data over time and store it.	Sometimes editing an image can fix something when you captured it or change the way you feel about it. When images are taken upside down, you might need to rotate it.	Repetition is where actions or commands in programming are repeated. The repeated commands can also be placed in to a loop. In an infinite loop, commands are repeated over and over again, without an end point. In Scratch, this is called the **repeat forever** block.

	destination. The internet is a network of networks connected by physical cables joining networks and that these cables can be on land or under the sea. Any website or web page is part of the World Wide Web, but that it is only one part of the internet. Files can also be shared on the internet. A file shared on the internet will also be routed through the same system of routers as a website would be, however the service is different. The 'www' is an abbreviation of 'World Wide Web', the middle part is usually associated with the theme or organisation behind the website, and the end part indicates where a website originates from or the type of organisation, such as .com, .edu, or .co.uk.	Audacity allows you record and edit sound and play them. There are many legal audio download and streaming services, such as Spotify, BBC Sounds, Apple Music, Deezer, and YouTube Music, which they can safely use when they are of an appropriate age.	latter are called 'count-controlled loops'. Code tracing is reading a code line by line and saying exactly what each command will make happen when it runs. Decomposing code snippets is breaking them down to make them easier to plan and work with. Procedures are code snippets – breaking them down makes them easier to work with. When creating a procedure, the word 'TO' is typed followed by the procedure name, eg. TO SQUARE	Data loggers usually have built in sensors for light, temperature, and sound. Input devices allow data to be entered into a computer. Keyboards, mice and microphones are all input devices. A sensor is a type of input designed to allow computers to capture data from a physical environment. Sensors can be connected to a computer to capture data about temperature, light, sound, humidity, pressure etc. Data loggers capture data at given time intervals. The interval is a regular time period between each data capture and can vary according to the experiment. For example, if data is being logged for a week, the interval might be every hour.	When you crop an image, do delete a part of an image that you don't want. Composition means the way that something is put together or arranged. You can use an image editor to change the colour and brightness of a photo. You can use cloning to change the composition of a photo and also retouch an image. This focuses on improving a small part that you didn't like in the original photo. You can use a computer to combine images.	Using a count-controlled loop, you can create different shapes using programming. Costumes are alternative appearances of a sprite, which can be named, edited, created, and deleted
Vocabulary	Network, World wide web (WWW), Websites, Content, Online, Copyright, Legal, Accurate, Reshare	Digital audio, Copyright, Recording, Podcast, Audio file, Inputs, Outputs, Export, Fade	Program, commands, code snippet, algorithm, pattern, repetition, count-controlled loop, decompose, procedure, debug	Input device, sensor, data logger, data point, interval, analyse, import, export, collection	crop, rotate, adjustments, hue, saturation, sepia, vignette, retouch, clone, composite, alter, background, foreground	Repetition, Count-controlled, Infinite, Modify, Animation, Algorithms

UKS2 Overview YEAR A			
	Autumn 2022	Spring 2023	Summer 2023

Strand of Computing:	Computer systems and networks	Creating media	Programming	Data and information	Creating media	Programming
Area:	**Sharing information**	**Video editing**	**Selection in physical computing**	**Flat-file databases**	**Vector drawing**	**Selection in quizzes**
Big question/ Statement:	How is information transferred between system and devices?	How can a video be shared with others?	Is computing just digital?	How can a flat-file database be used to organise data?	You can create images using different tools.	How do we create a quiz using programming?
Outcome:	Assessment (Teach Computing)	Own video on theme of choice or WC based?	A fairground ride	Use a real-world database to answer questions	A vector drawing	Design and program and quiz on Scratch
Substantive knowledge:	A system is a number of things (parts, components, people) that work together to complete or perform a task. Digital systems are used in a wide range of public contexts, e.g. airport, rail, or bus station arrival and departure boards. Search engines are systems and in a search engine system, the search engine looks for information. The input is the entering of the search term and the outputs are the results displayed. There are two common ways to conduct a search: using the search box in the search engine itself or typing the term into the address bar of the browser (sometimes referred to as the 'omnibox'). (lesson 4)	-	-	-	-	-
Vocabulary	System, connection, search, search engine, refine, Index, crawler, bot,	Editing, Production, Panning, Talking head, Close up, Capture Audio	Crumble, Sparkle, Motor, Conditions, Algorithms, Actions, Microcontroller, Output, LEDs	Database, Data, Records, Fields, Grouping, Sorting, Chart		

UKS2 Overview YEAR B						
	Autumn 2023		Spring 2024		Summer 2024	
Strand of Computing:	**Computer systems and networks**	**Creating media**	**Programming**	**Data and information**	**Creating media**	**Programming**
Area:	**Communication**	**Web page creation**	**Variables in games**	**Introduction to spreadsheets**	**3D modelling**	**Sensing**
Big question/ Statement:	How do we communicate responsibly?	What makes a good website?	Variables ensure games change.	How do spreadsheets organise data?	You can't create 3D things on a computer.	You can use programming to code anything.
Outcome:	Assessment (Teach Computing)	Design own website	Create own game	Assessment (Teach computing)	3D building computer model	Programming a compass and step counter
Substantive knowledge	-	-	-	-	-	-
Vocabulary		Website, HTML, Fair use, Copyright, Web page, Navigation paths, Hyperlinks	Variables, Strings, Outcome, Values, Abstraction, Sprites, Code	Spreadsheet, Organise, Analyse, Data headings, Data set, Cells, Formulas, Inputs, Outputs, Duplicating		

Computing systems and networks

	EYFS	KS1	LKS2	UKS2

Content/ Knowledge from NC		• Recognise common uses of information technology beyond school • Use technology purposefully to create, organise, store, manipulate, and retrieve digital content • 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.	• use sequence, selection, and repetition in programs; work with variables and various forms of input and output • understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web; and the opportunities they offer for communication and collaboration • 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 • Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	

Disciplinary knowledge (Skills)	Recognise a variety of different items of technology and understand their purpose. Be able to write my name on a keyboard Be aware of the internet	• **Technology around us** - Choose a piece of technology to do a job - recognise that some technology can be used in different ways - identify the main parts of a computer - use a mouse in different ways - use a keyboard to type - use a keyboard to edit text - use technology safely • **IT around us** - Describe some uses of computers - Identify information technology in school - Identify information technology beyond school - Show how to use information technology safely		• **Connecting computers** - identify input and output devices - explain that a computer system accepts an input and processes it to produce an output - explain how a computer network can be used to share information - explain the role of a switch, server and a wireless access point in a network - identify network devices around me - explain how network devices can be connected to other networks. • **The internet** - describe how networks connect to other networks - Explain what the World Wide Web is and how and what we use it for. - Explain that the WWW consists of websites and webpage		• **Systems and searching** - Describe the input and output of a search engine - Demonstrate that different search terms produce different results - Evaluate the results of search terms • **Communication and collaboration** - Outline methods of communicating and collaborating using the internet - Choose methods of internet communication and collaboration for given purposes - Evaluate different methods of online communication and collaboration - Decide what you should and should not share online
Vocabulary		**Technology** **Computer** **Mouse** **Trackpad** **Keyboard** **Screen**	**double-click** **Typing** **Information** **Barcode** **Scanner** **Scan**	**digital device** **input** **process** **output** **program** **server** **computer network**	**wireless access point** **network hardware** **Internet** **Router** **network security** **network switch**	

Creating Media

	EYFS	KS1	LKS2	UKS2
Content/ Knowledge from NC		• Use technology purposefully to create, organise, store, manipulate, and retrieve digital content • 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	• 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 • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	

Disciplinary knowledge (Skills)	Independently take multiple photos. Begin to learn how to record a video of another child in my class.	• **Digital painting** - Create a picture using freehand tools - use shape and line tools when precision is needed - use a range of paint colours - use the fill tool to colour an enclosed area - use the undo button to correct a mistake - combine a range of tools to create a piece of artwork • **Digital writing** - Use letter, number, and space keys to enter text into a computer - Use punctuation and special characters - Select text - Use the backspace key to remove text - Position the text curser in a chose location - Choose options to achieve a desired effect - Change the appearance of text on a computer - Use undo • **Digital photography** - Capture a digital image - Take photographs in both landscape and portrait format - View photographs on a digital device - Decide which photographs to keep - Hold a camera still to take a clear photograph - Use zoom to change the composition of a photograph - Consider lighting before taking a photograph - Use filters to edit the appearance of a photograph - Improve a photograph by retaking it • **Digital music** - Experiment with musical patterns on a computer	• **Stop-frame animation** - plan an animation on a story board - set up the work area with an awareness of what will be captured - capture an image - use the onion skinning tool to review subject position - move a subject between captures - review a captured sequence of frames as an animation - remove frames to improve an animation - add media to enhance an animation - review a completed project • **Desktop publishing** - Show that page orientation can be changed - Organise text and image placeholders in a page layout - Add text to a placeholder - Add and remove images to and from placeholders - Edit text in a placeholder - Move, resize and rotate images - Choose fonts and apply effects to text - Review a document • **Audio Production** - Record sound using a computer - Play recorded audio - Import audio into a project - Delete a section of audio - Change the volume of tracks in a project • **Photo Editing** - Use an application to change the whole of a digital image - Use an application to change part of a digital image - Use an application to add to the composition of a digital image - Change the composition by cropping - Adjust colours of a digital image	• **Video production** - Use different camera angles - Use pan, tilt and zoom - Identify features of a video recording device or application - Combine filming techniques for a given purpose - Determine what scenes will convey an idea - Choose to reshoot a scene or improve later through editing - Decide what changes need to be made when editing - Use split, trim and crop to edit a video • **Introduction to vector graphics** - Add an object to a vector drawing - Select one object or multiple objects - Group and ungroup selected objects - Delete objects - Move objects between layers of a drawing - Duplicate objects using copy and paste - Modify objects - Reposition objects - Combine options to achieve a desired effect - Create a vector drawing for a given purpose • **Web page creation** - Review an existing website - Create a new blank web page - Add text to a web page - Set the style of text on a web page - Change the appearance of text - Embed media in a web page - Add web pages to a website - Preview a web page (different screen sizes) - Insert hyperlinks between pages - Insert hyperlinks to another site

		- Experiment with different sounds on a computer - Use a computer to create a musical pattern - Use a computer to compose a rhythm and a melody on a given theme - Use a computer to play the same music in different ways (tempo) - Evaluate a musical composition created on a computer - Improve a musical composition created on a computer		- Apply filters and effects to a digital image - Select part of a digital image - Use clone, copy and paste to change the composition of a digital image - Use cloning to retouch a digital image - Add text to a digital image		• **3D modelling** - Position 3D shapes relative to one another - Use digital tools to modify 3D shapes - Combine objects to create a 3D digital artefact - Use digital tools to accurately size 3D objects - Construct a 3D model which reflect a real-world object
Vocabulary		**Erase** **Fill** **Undo** **Shape tools** **Brush style** **Device** **Photograph** **Capture** **Digital** **Framing** **Compose** **Focus** **Filter**	**Formatting** **Word processor** **Curser** **Toolbar** **Bold** **Font** **Redo** **Format** **Rhythm** **Pattern** **Notes** **Tempo**	**Stop-frame animation** **Onion skinning** **Consistency** **Media** **Import** **Transition** **Style** **Template** **Audio** **Microphone** **Speaker** **Headphones** **Podcast** **Trim**	**Align** **Crop** **Rotate** **Adjustments** **Hue** **Saturation** **Sepia** **Vignette** **Retouch** **Clone** **Composite** **Alter** **Background** **Foreground**	

Data and information

	EYFS	KS1	LKS2	UKS2
Content/ Knowledge from NC		• Use technology purposefully to create, organise, store, manipulate, and retrieve digital content • 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	• 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 • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • Use technology safely, respectfully and responsibly	
Disciplinary knowledge (Skills)		• **Grouping data** - Identify some attributes of an object. - Collect simple data - show that collected data can be counted. - describe the properties of an object - choose an attribute to group objects by. - group objects to answer questions - explain that objects can be grouped by similarities - Describe a group of objects • **Pictograms** - Enter data onto a computer - Recognise that people, animals and objects can be described by attributes - Use a computer to view data in different formats - Use pictograms to answer single-attribute questions - Use a computer to answer comparison questions (graphs, tables)	• **Branching Databases** - Create questions with yes/no answers - Choose questions that will divide objects into evenly size subgroups - Repeatedly create subgroups of objects - Identify an object using a branching database - Retrieve information from different levels of the branching database • **Data Logging** - Use a digital device to collect data automatically - Choose how often to automatically collect data samples - Use a set of logged data to find information - Use a computer program to sort data by one attribute - Export information in different formats	• **Flat file databases** - Choose different ways to view data - Choose which attribute and value to search by to answer a given question (operands) - Ask questions that need more than one attribute to answer - Choose which attribute to sort data by to answer a given question - Choose multiple criteria to search data to answer a given question (AND and OR) - Select an appropriate graph to visually compare data - Choose suitable ways to present information to people • **Introduction to spreadsheets** - Calculate data using a formula for each operation - Use functions to create new data - Use existing cells within a formula - Choose suitable ways to present spreadsheet data

Vocabulary		**Object** **Label** **Group** **Search** **Property** **Value**	**data set** **Pictogram** **Tally chart** **Attribute** **Block diagram**	**Questions** **Table** **branching databases** **separate** **sensor** **data logger**	**data point** **interval** **analyse** **import** **export** **collection**	

Programming

	EYFS	KS1	LKS2	UKS2
Content/ Knowledge from NC	Be able to move the Beebot forwards and backwards as well as turn left and right.	• 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 • Recognise common uses of information technology beyond school • Use technology purposefully to create, organise, store, manipulate and retrieve digital content	• 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 • 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	

Disciplinary knowledge (Skills)		• **Moving a robot** - enact a given word - predict the outcome of a command on a device - list which commands can be used on a given device - run a command on a floor robot - choose a command for a given purpose - Choose a series of words that can be enacted as a program - Choose a series of commands that can be run as a program - Build a sequence of commands in steps - Combine commands in a program - Run a program on a device • **Programming animations** - Choose a series of words that can be enacted as a program - Choose a series of commands that can be run as a program - run a program on a device • **Robot algorithms** - Choose a series of words that can be enacted as a sequence - Choose a series of instruction that can be run as a program - Create a program - Trace a sequence to make a prediction - Run a program on a device - Debug a program that I have written • **Programming quizzes** - Choose a series of words that be enacted as a sequence - Explain what happens when we change the order instructions - To choose a series of commands that can be run as a program - Trace a sequence to make a prediction - Test a prediction by running the sequence	• **Sequencing Sounds** - Build a sequence of commands - Combine commands in a program - Order commands in a program - Create a sequence of commands to produce a given outcome • **Events and actions in programs** - Build a sequence of commands - Combine commands in a program - Order commands in a program - Create a sequence of commands to produce a given outcome • **Repetition in Shapes** - List an everyday task as set of instructions including repetition - Use an indefinite loop to produce a given outcome - Use a count-controlled loop to produce a given outcome - Plan a program that includes appropriate loops to produce a given outcome - Recognise tools that enable more than one process to be run at the same time (concurrency) - Create two or more sequences that run at the same time • **Repetition in games** - List an everyday task as set of instructions including repetition - Use an indefinite loop to produce a given outcome - Use a count-controlled loop to produce a given outcome - Plan a program that includes appropriate loops to produce a given outcome - Recognise tools that enable more than one process to be run at the same time (concurrency)	• **Selection in physical computing** - Create a condition-controlled loop - Use a condition in an 'if… then...' statement to start an action - Use selection to switch the program flow in one of two ways - Use a condition in an 'if… then… else…' statement to produce given outcomes • **Selection in quizzes** - Create a condition-controlled loop - Use a condition in an 'if… then...' statement to start an action - Use selection to switch the program flow in one of two ways - Use a condition in an 'if… then… else…' statement to produce given outcomes • **Variables in games** - Identify a variable in an existing program - Experiment with the value of an existing variable - Choose a name that identifies the role of a variable to make it easier for humans to understand it - Decide where in a program to set a variable - Update a variable with a user input - Use an event in a program to update a variable - Use a variable in a conditional statement to control the flow of a program - Use the same variable in more than one location in a program • **Sensing movement** - Identify a variable in an existing program - Experiment with the value of an existing variable

		- Create and debug a program that has been written - Run a program on a device		- Create two or more sequences that run at the same time		- Choose a name that identifies the role of a variable to make it easier for humans to understand it - Decide where in a program to set a variable - Update a variable with a user input - Use an event in a program to update a variable - Use a variable in a conditional statement to control the flow of a program - Use the same variable in more than one location in a program
Vocabulary		**Command** **Instruction** **Directions** **Algorithm** **Program** **Route** **Sprite,** **Programming**	**Block** **Joining** **Start block** **Run** **Reset** **Instructions** **Debugging** **Sequence**	**motion** **glide** **event** **Motion** **Logic** **Extension block** **Design** **Errors** **Set up** **code snippet**	**pattern** **repetition** **count-controlled loop** **decompose** **procedure** **Programming** **infinite loop** **animate** **duplicate**	