St John the Baptist C of E Primary School

Computing

Skills and Progression

St. John the Baptist Primary School
Computing Skills & Vocabulary Progression Overview

'Computer Science is a rigorous academic discipline of great importance to the future careers of many pupils' and that 'Every child should have the opportunity to learn Computing at school' – *The Royal Society*

Intent

At St John the Baptist Primary School, our aim is to develop 'thinkers of the future' through a modern, ambitious and relevant education in computing. We want to equip pupils to use computational thinking and creativity that will enable them to become active participants in the digital world. It is important to us that the children understand how to use the ever-changing technology to express themselves, as tools for learning and as a means to drive their generation forward into the future.

Whilst ensuring they understand the advantages and disadvantages associated with online experiences, we want children to develop as respectful, responsible and confident users of technology, aware of measures that can be taken to keep themselves and others safe online. It is important to us that our pupils understand that there is always a choice with using technology and as a school we utilise technology to model positive use.

Our aim is to provide a computing curriculum that is designed to develop a broad and deep knowledge alongside opportunities to apply skills in various digital contexts. Beyond teaching computing discreetly, we will give pupils the opportunity to apply and develop what they have learnt across wider learning in the curriculum. We want our pupils to be fluent with a range of tools to best express their understanding and hope by the end of Year 6, children have the independence and confidence to choose the best tool to fulfil the task and challenge set by teachers.

Implementation

Our scheme of work for Computing is adapted from the 'Teach Computing' Curriculum and covers all aspects of the National Curriculum. This scheme was chosen as it has been created by subject experts and based on the latest pedagogical research. It provides an innovative progression framework where computing content (concepts, knowledge, skills and objectives) has been organised into interconnected networks called learning graphs.

The curriculum aims to equip young people with the knowledge, skills and understanding they need to thrive in the digital world of today and the future. The curriculum can be broken down into 3 strands: computer science, information technology and digital literacy, with the aims of the curriculum reflecting this distinction.

The National Curriculum for computing aims to ensure all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation (Computer science)
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems (Computer science)
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems (Information technology)
- are responsible, competent, confident and creative users of information and communication technology. (Digital literacy)

In addition to the scheme, KS2 children access Code.org and Scratch to develop their understanding of coding.

Year 1 Computing Curriculum – Teach Computing

Learning Unit	Unit summary	Objectives	Link to the National Curriculum	Vocabulary
Computer systems and Networks Technology around us	Recognising technology in school and using it responsibly	• To identify technology • To identify a computer and its main parts • To use a mouse in different ways • To use a keyboard to type on a computer • To use the keyboard to edit text • To create rules for using technology responsibly	• 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.	technology, computer, mouse, trackpad, keyboard, screen, double-click, typing
Creating Media Digital painting	Choosing appropriate tools in a program to create art, and making comparisons with working nondigitally.	• To describe what different freehand tools do • To use the shape tool and the line tools • To make careful choices when painting a digital picture • To explain why I chose the tools I used • To use a computer on my own to paint a picture • To compare painting a picture on a computer and on paper	• Use technology purposefully to create, organise, store, manipulate, and retrieve digital content	paint program, tool, paintbrush, erase, fill, undo, shape tools, line tool, fill tool, undo tool, colour, brush style, brush size, pictures, painting, computers
Programming Moving a robot	Writing short algorithms and programs for floor robots, and predicting program outcomes.	• To explain what a given command will do • To act out a given word • To combine forwards and backwards commands to make a sequence • To combine four direction commands to make sequences • To plan a simple program • To find more than one solution to a problem	• 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 • Recognise common uses of information technology beyond school	BeeBot, forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, route, plan, algorithm, program.
Data and Information Grouping data	Exploring object labels, then using them to sort and group objects by properties.	• To label objects • To identify that objects can be counted • To describe objects in different ways • To count objects with the same properties • To compare groups of objects • To answer questions about groups of objects	• 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.	object, label, group, search, image, property, colour, size, shape, value, data set, more, less, most, fewest, least, the same
Creating Media Digital writing	Using a computer to create and format text, before comparing to writing nondigitally.	• To use a computer to write • To add and remove text on a computer • To identify that the look of text can be changed on a computer • To make careful choices when changing text • To explain why I used the tools that I chose • To compare typing on a computer to writing on paper	• 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.	word processor, keyboard, keys, letters, type, numbers, space, backspace, text cursor, capital letters, toolbar, bold, italic, underline, mouse, select, font, undo, redo, format, compare, typing, writing.

Programming Programming animations	Designing and programming the movement of a character on screen to tell stories.	• To choose a command for a given purpose • To show that a series of commands can be joined together • To identify the effect of changing a value • To explain that each sprite has its own instructions • To design the parts of a project • To use my algorithm to create a program	• 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	ScratchJr, command, sprite, compare, programming, area, block, joining, start, run, program, background, delete, reset, algorithm, predict, effect, change, value, instructions, design.

Year 2 Computing Curriculum – Teach Computing

Learning Unit	Unit summary	Objectives	Link to the National Curriculum	Vocabulary
Computer systems and Networks Information technology around us	Identifying IT and how its responsible use improves our world in school and beyond	• To recognise the uses and features of information technology • To identify the uses of information technology in the school • To identify information technology beyond school • To explain how information technology helps us • To explain how to use information technology safely • To recognise that choices are made when using information technology	• 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.	Information technology (IT), computer, barcode, scanner/scan
Creating Media Digital photography	Capturing and changing digital photographs for different purposes	• To use a digital device to take a photograph • To make choices when taking a photograph • To describe what makes a good photograph • To decide how photographs can be improved • To use tools to change an image • To recognise that photos can be changed	• 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.	device, camera, photograph, capture, image, digital, landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, format, framing, lighting,
Programming Robot algorithms	Creating and debugging programs, and using logical reasoning to make predictions.	• To describe a series of instructions as a sequence • To explain what happens when we change the order of instructions • To use logical reasoning to predict the outcome of a program • To explain that programming projects can have code and artwork • To design an algorithm • To create and debug a program that I have written	• 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 • 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.	instruction, sequence, clear, unambiguous, algorithm, program, order, prediction, artwork, design, route, mat, debugging, decomposition
Data and Information Pictograms	Collecting data in tally charts and using attributes to organise and present data on a computer.	• To recognise that we can count and compare objects using tally charts • To recognise that objects can be represented as pictures • To create a pictogram • To select objects by attribute and make comparisons • To recognise that people can be described by attributes • To explain that we can present information using a computer	• 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.	more than, less than, most, least, common, popular, organise, data, object, tally chart, votes, total, pictogram, enter, data, compare, objects, count, explain, attribute, group, same, different, conclusion, block diagram, sharing
Creating Media Digital music	Using a computer as a tool to explore rhythms and melodies,	• To say how music can make us feel • To identify that there are patterns in music • To experiment with sound using a computer • To use a computer to create a musical pattern	• Use technology purposefully to create, organise, store, manipulate, and retrieve digital content	music, quiet, loud, feelings, emotions, pattern, rhythm, pulse, pitch, tempo, rhythm,

	before creating a musical composition.	• To create music for a purpose • To review and refine our computer work		notes, create, emotion, beat, instrument, open, edit.
Programming Programming quizzes	Designing algorithms and programs that use events to trigger sequences of code to make an interactive quiz.	• To explain that a sequence of commands has a start • To explain that a sequence of commands has an outcome • To create a program using a given design • To change a given design • To create a program using my own design • To decide how my project can be improved	• 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 • Use technology purposefully to create, organise, store, manipulate, and retrieve digital content	sequence, command, program, run, start, outcome, predict, blocks, design, actions, sprite, project, modify, change, algorithm, build, match, compare, debug, features, evaluate, decomposition, code.

Rowan – Year A

Learning Unit	Unit summary	Objectives	Link to the National Curriculum	Vocabulary
Online Safety	what not to say or do online; how to protect online information using passwords and ask an adult if they find themselves in a tricky situation. how to make good decisions when online and how to be kind to others. understand what they can do if they see something that upsets them or makes them feel uncomfortable when online.	• What is a digital footprint? • Why do I need a strong password? • Why should I keep personal information private online? • How can I build positive and healthy online relationships? • What do I do if I see upsetting material online or experience cyber bullying?	• To 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	Malicious, phishing, scam, authentic, online privacy, personal information, digital footprint
Programming Code.org (Express Course 2024)	**Programming with Angry Birds** Develop sequential algorithms to move a bird from one side of a maze to the pig at the other side. **Debugging in Maze** Encounter pre-written code that contains mistakes; step through the existing code to identify errors. **Collecting treasure with Laurel** Continue to develop understanding of algorithms and debugging. Create sequential algorithms. **Creating art with Code** Take control of the Artist to complete drawings on the screen.	• Identify and locate bugs in a program. • Translate movements into a series of commands. • Modify an existing program to solve errors. • Predict where a program will fail. • Reflect on the debugging process in an age-appropriate way. • Develop problem solving and critical thinking skills by reviewing debugging practices. • Order movement commands as sequential steps in a program. • Represent an algorithm as a computer program. • Break complex shapes into simple parts. • Create a program to complete an image using sequential steps. • Use numbers as angle measurements and distances.	• 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 • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	Algorithm, Bug, Debugging, Sequencing, Program, Programming, Behaviour, Sprite, Event, code, Loop, Repeat, Command, Condition, Conditionals, While Loop, Until
Data and information Branching databases	Building and using branching databases to group objects using yes/no questions.	• To create questions with yes/no answers • To identify the attributes needed to collect data about an object • To create a branching database selected objects to arrange in a branching • To explain why it is helpful for a database to be well structured • To plan the structure of a branching database	• 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	Attribute, value, questions, table, objects, branching database, database, equal, even, separate, objects, structure, compare, order, organise, selecting
Programming Stop Frame animation	Capturing and editing digital still images to produce a stop frame animation that tells a story	• To explain that animation is a sequence of drawings or photographs • To relate animated movement with a sequence of images	• 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	animation, flip book, stopframe, frame, sequence,

		• To plan an animation • To identify the need to work consistently and carefully • To review and improve an animation • To evaluate the impact of adding other media to an animation	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.	image, photograph, setting, character, events, onion skinning, consistency, evaluation, delete, media, import, transition.
Programming Repetition in Games	Using a block-based programming language to explore count-controlled and infinite loops when creating a game.	• To develop the use of count-controlled loops in a different programming environment • To explain that in programming there are infinite loops and count controlled loops • To develop a design that includes two or more loops which run at the same time • To modify an infinite loop in a given program • To design a project that includes repetition • To create a project that includes repetition	• 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; and the opportunities they offer for communication and collaboration • use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • 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.	Scratch, programming, sprite, blocks, code, loop, repeat, value, infinite loop, count-controlled loop, costume, repetition, forever, animate, event block, duplicate, modify, design, algorithm, debug, refine, evaluate.
Programming Sequencing Sounds	Creating sequences in a block-based programming language to make music.	• To explain that animation is a sequence of drawings or photographs • To relate animated movement with a sequence of images • To plan an animation • To identify the need to work consistently and carefully • To review and improve an animation • To evaluate the impact of adding other media to an animation • To explore a new programming environment • To identify that commands have an outcome	• 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	Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, sequence, event, task, design, run the code, order,

		• To explain that a program has a start • To recognise that a sequence of commands can have an order • To change the appearance of my project • To create a project from a task description	• 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	note, chord, algorithm, bug, debug, code.

Rowan – Year B

Learning Unit	Unit summary	Objectives	Link to the National Curriculum	Vocabulary
Online Safety	Children will learn what not to say or do online so that is does not damage their online reputation. They learn how to protect their online information using passwords and ask an adult if they find themselves in a tricky situation. They learn how to make good decisions when online and how to be kind to others. Finally, they understand what they can do if they see something that upsets them or makes them feel uncomfortable when online.	• What is a digital footprint? • Why do I need a strong password? • Why should I keep personal information private online? • How can I build positive and healthy online relationships? • What do I do if I see upsetting material online or experience cyber bullying?	• To 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	Malicious, phishing, scam, authentic, online privacy, personal information, digital footprint
Programming Code.org	**Swimming Fish with Sprite Lab** program a simple animated underwater scene lesson. **Making Sprites** Children write programs and learn about the two concepts at the heart of Sprite Lab: sprites and behaviours. **Sprites in Action** Children will write programs that respond to timed events and user input. **Mini Project** Create an interactive Virtual Pet - use Sprite Lab's "Costumes" tool to customize pet's appearance. Use events, behaviours, and other concepts to bring project to life.	• Create new sprites and assign them costumes and behaviours. • Define “sprite” as a character or object on the screen that can be moved and changed. • Modify an existing program in order add more advanced features. • Create an animation using sprites, and behaviours. • Create new sprites and assign them costumes and behaviours. • Create an interactive animation using events. • Develop programs that respond to timed events and user input. • Create an interactive virtual pet using events, behaviours, and custom art. • Program solutions to problems that arise when designing a virtual pet, like feeding it.	• 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; and the opportunities they offer for communication and collaboration • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	Algorithm, Behaviour, Program, Sprite, Event

Programming Events and actions in programs	Writing algorithms and programs that use a range of events to trigger sequences of actions.	• To recognise how text and images convey information • To recognise that text and layout can be edited • To choose appropriate page settings • To add content to a desktop publishing publication • To consider how different layouts can suit different purposes • To consider the benefits of desktop publishing • To explain how a sprite moves in an existing project • To create a program to move a sprite in four directions • To adapt a program to a new context • To develop my program by adding features • To identify and fix bugs in a program • To design and create a maze-based challenge	• 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	motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, pen, design, action, debugging, errors, setup, code, test, debug, actions.
Creating media Desktop Publishing	Creating documents and modifying text, images and page layouts for a specific purpose.	• To recognise how text and images convey information • To recognise that text and layout can be edited • To choose appropriate page settings • To add content to a desktop publishing publication • To consider how different layouts can suit different purposes • To consider the benefits of desktop publishing •	• use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • 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	text, images, advantages, disadvantages, communicate, font, style, landscape, portrait, orientation, placeholder, template, layout, content, desktop publishing, copy, paste, purpose, benefits.
Computing systems and networks Connecting computers	Identifying that digital devices have inputs, processes, and outputs, and how devices can be connected to make networks	• To explain how digital devices function • To identify input and output devices • To recognise how digital devices can change the way we work • To explain how a computer network can be used to share information • To explore how digital devices can be connected • To recognise the physical components of a network	• 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	digital device, input, process, output, program, digital, non-digital, connection, network, switch, server, wireless access point, cables, sockets
Creating media Audio production	Capturing and editing audio to produce a podcast, ensuring that copyright is considered.	• To identify that sound can be recorded • To explain that audio recordings can be edited • To recognise the different parts of creating a podcast project	• design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	audio, microphone, speaker, headphones, input device, output device, sound,

		• To apply audio editing skills independently • To combine audio to enhance my podcast project • To evaluate the effective use of audio	• 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; and the opportunities they offer for communication and collaboration • use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • 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.	podcast, edit, trim, align, layer, import, record, playback, selection, load, save, export, MP3, evaluate, feedback.

Holly – Year A

Learning Unit	Unit summary	Objectives	Link to the National Curriculum	Vocabulary
Online Safety	Children will learn about email safety with a focus on preventing and dealing with spam. They will consider the importance of strong passwords and learn how to create them. Children will build on their knowledge of plagiarism and fair use of people's work by learning how to write citations and references for websites they may use. They will scrutinise photographs that they see online and learn how easy it is to manipulate pictures and present them as reality.	• To identify spam emails and what to do with them. • To write citations for the websites I use for research. • To create strong passwords. • To recognise when, why and how photographs we see online may have been edited. • To apply online safety rules to real-life scenarios.	• To 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	Email, spam, link, privacy, virus, scam, phishing, inbox, junk, sender, subject, cite, citation, plagiarism, source, website, bibliography, passwords, secure, safe, account, online, private, posts, media, image, photography, digital, photoshop, edit, filter, apps, software, social media, adverts, online, copyright, personal information, social media.
Programming Code.org	**Dance Party** students will program an interactive dance party. **Loops with Rey** students will learn to add instructions to existing loops, gather repeated code into loops, and recognize patterns that need to be looped **Mini Project – Sticker Art** builds on the understanding of loops. Students will create unique artwork with the Artist. **Nested Loops in Maze** will learn how to program a loop inside of another loop.	• Create dance animations with code • Develop programs that respond to timed events • Develop programs that respond to user input • Break down a long sequence of instructions into the largest repeatable sequence. • Employ a combination of sequential and looped commands to reach the end of a maze. • Identify the benefits of using a loop structure instead of manual repetition. • Differentiate between commands that need to be repeated in loops and commands that should be used on their own. • Break complex tasks into smaller repeatable sections. • Identify the benefits of using a loop structure instead of manual repetition. • Recognize large repeated patterns as made from smaller repeated patterns.	• 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 • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	event, program, code, loop, repeat, command
Data and Information Flat File databases	Using a database to order data and create charts to answer questions.	• To use a form to record information • To compare paper and computer-based databases • To outline how you can answer questions by grouping and then sorting data	• use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • 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	database, data, information, record, field, sort, order, group, search, value, criteria, graph, chart, axis, compare, filter, presentation.

		• To explain that tools can be used to select specific data • To explain that computer programs can be used to compare data visually • To use a real-world database to answer questions	that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	
Programming Repetition in shapes	Using a text-based programming language to explore count-controlled loops when drawing shapes.	• To identify that accuracy in programming is important • To create a program in a textbased language • To explain what 'repeat' means • To modify a countcontrolled loop to produce a given outcome • To decompose a task into small steps • To create a program that uses countcontrolled loops to produce a given outcome	• 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	Logo (programming environment), program, turtle, commands, code snippet, algorithm, design, debug, pattern, repeat, repetition, count-controlled loop, value, trace, decompose, procedure.
Computing systems and networks The Internet	Recognising that the internet is a network of networks including the WWW, and why we should evaluate online content.	• To describe how networks physically connect to other networks • To recognise how networked devices make up the internet • To outline how websites can be shared via the World Wide Web (WWW) • To describe how content can be added and accessed on the World Wide Web (WWW) • To recognise how the content of the WWW is created by people • To evaluate the consequences of unreliable content	• 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 • use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • 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.	internet, network, router, security, switch, server, wireless access point (WAP), website, web page, web address, routing, web browser, World Wide Web, content, links, files, use, download, sharing, ownership, permission, information, accurate, honest, content, adverts
Creating media Photo editing	Manipulating digital images, and reflecting on the impact of the changes and whether the required purpose is fulfilled,	• To explain that the composition of digital images can be changed • To explain that colours can be changed in digital images	• use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	image, edit, digital, crop, rotate, undo, save, adjustments, effects, colours, hue, saturation, sepia, vignette,

		• To explain how cloning can be used in photo editing • To explain that images can be combined • To combine images for a purpose • To evaluate how changes can improve an image	• 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.	image, retouch, clone, select, combine, made up, real, composite, cut, copy, paste, alter, background, foreground, zoom, undo, font.

Holly – Year B

Learning Unit	Unit summary	Objectives	Link to the National Curriculum	Vocabulary
Online Safety	Children will learn what not to say or do online so that is does not damage their online reputation. They learn how to protect their online information using passwords and ask an adult if they find themselves in a tricky situation. They learn how to make good decisions when online and how to be kind to others. Finally, they understand what they can do if they see something that upsets them or makes them feel uncomfortable when online.	• What is a digital footprint? • Why do I need a strong password? • Why should I keep personal information private online? • How can I build positive and healthy online relationships? • What do I do if I see upsetting material online or experience cyber bullying?	• To 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	Malicious, phishing, scam, authentic, online privacy, personal information, digital footprint
Programming Code.org	**Looking ahead with Minecraft** build on knowledge of loops, and introduce conditionals. Children will explore the potential for creating fun and innovative programs in a new and exciting environment.	• Define circumstances when certain parts of a program should run and when they shouldn't. • Determine whether a conditional is met based on criteria.	• design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	Condition, conditionals
Word Processing Intermediate	Children learn and develop a range of skills from manipulating windows including viewing 2 windows at once, taking screenshots, aligning text, creating hyperlinks and using a range of shortcuts to help them.	• To take a screenshot and use the snipping tool • To align text • To add bullets and numbering to my text? • To create hyperlinks within a word document • To use shortcuts	• 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.	Snipping tool, Screenshot, Search bar, Copy, Paste Save, Align Left / right / centre Show characters, Space bar Bold Underline italic, bullets, hyperlink

Programming Repetition in games	Using a block-based programming language to explore count-controlled and infinite loops when creating a game.	• To develop the use of count-controlled loops in a different programming environment • To explain that in programming there are infinite loops and count controlled loops • To develop a design that includes two or more loops which run at the same time • To modify an infinite loop in a given program • To design a project that includes repetition • To create a project that includes repetition	• 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	Scratch, programming, sprite, blocks, code, loop, repeat, value, infinite loop, count-controlled loop, costume, repetition, forever, animate, event block, duplicate, modify, design, algorithm, debug, refine, evaluate.
Data and Information Data logging	Recognising how and why data is collected over time, before using data loggers to carry out an investigation,	• To explain that data gathered over time can be used to answer questions • To use a digital device to collect data automatically • To explain that a data logger collects 'data points' from sensors over time • To recognise how a computer can help us analyse data • To identify the data needed to answer questions • To use data from sensors to answer questions	• use sequence, selection, and repetition in programs; work with variables and various forms of input and output • 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	data, table, layout, input device, sensor, logger, logging, data point, interval, analyse, dataset, import, export, logged, collection, review, conclusion.
Computing systems and Networks – Systems and Searching	Recognising IT systems in the world and how some can enable searching on the internet.	• To explain that computers can be connected together to form systems • To recognise the role of computer systems in our lives • To experiment with search engines • To describe how search engines select results • To explain how search results are ranked • To recognise why the order of results is important, and to whom	• design, write and debug programs that accomplish specific • use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • 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.	system, connection, digital, input, process, storage, output, search, search engine, refine, index, bot, ordering, links, algorithm, search engine optimisation (SEO), web crawler, content creator, selection, ranking.

Oak – Year A

Learning Unit	Unit summary	Objectives	Link to the National Curriculum	Vocabulary
Online Safety	Understanding how 'digital mistakes' can hurt feelings, reputations, and privacy. To understand that online content isn't always honest or reliable, and is sometimes even deliberately designed to steal personal information. Learning the basics of online privacy and security. Being smart about passwords. Understanding children are not on their own when they see content online that makes them feel uncomfortable.	• What is a positive digital footprint? • How to be a critical consumer while online. • Different online scams, including what 'phishing' means. • Develop safer habits online, including the importance of protecting personal information. • How to respect online privacy boundaries for themselves and others. • Ways to seek or ask for help if they or others feel unsafe online. • How to develop respectful, empathetic and healthy online relationships. • Ways to manage and respond in a healthy and safe way to hurtful online behaviour. • Specific ways to respond to bullying when you see it. • How to behave if you experience harassment. • Different ways to step in and be a helper in a specific situation. • How to recognise upsetting content and strategies for refusing it. • Strategies for upsetting content, including reporting to an adult.	• To 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	Catfishing, malicious, phishing, Scam, authentic, spear phishing, online privacy, Personal information, Curate, digital footprint, Vlogger, Clickbait
Programming Code.org Express 2024	**Else with Bee** Practice using conditionals in programs. The if / else blocks will allow for a more flexible program. The bee will only collect nectar *if* there is a flower or make honey *if* there is a honeycomb. **While Loops in Farmer** Children develop a beginner's understanding of condition-based loops and also expand their knowledge of loops in general. **Conditionals in Minecraft** build on knowledge of loops, and conditionals. Children will be able to explore the potential for creating fun and innovative programs in a new and exciting environment.	• Solve puzzles using a combination of looped sequences and conditionals. • Translate spoken language conditional statements into a program. • Distinguish between loops that repeat a fixed number of times and loops that repeat as long as a condition is true. • Use a while loop to create programs that can solve problems with unknown value Define circumstances when certain parts of a program should run and when they shouldn't. • Determine whether a conditional is met based on criteria.	• 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 • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	Condition, conditionals, loop, repeat, while loop

Data and information Introduction to spreadsheets	Answering questions by using spreadsheets to organise and calculate data.	• To create a data set in a spreadsheet • To build a data set in a spreadsheet • To explain that formulas can be used to produce calculated data • To apply formulas to data • To create a spreadsheet to plan an event • To choose suitable ways to present data	• 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	data, collecting, table, structure, spreadsheet, cell, cell reference, data item, format, formula, calculation, spreadsheet, input, output, operation, range, duplicate, sigma, propose, question, data set, organised, chart, evaluate, results, sum, comparison, software, tools.
Programming Variables in Games	Exploring variables when designing and coding a game.	• To define a 'variable' as something that is changeable • To explain why a variable is used in a program • To choose how to improve a game by using variables • To design a project that builds on a given example • To use my design to create a project • To evaluate my project	• 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 • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	variable, change, name, value, set, design, event, algorithm, code, task, artwork, program, project, code, test, debug, improve, evaluate, share, assign, declare
Creating media 3D Modelling	Planning, developing, and evaluation 3D computer models of physical objects.	• To recognise that you can work in three dimensions on a computer • To identify that digital 3D objects can be modified • To recognise that objects can be combined in a 3D model • To create a 3D model for a given purpose • To plan my own 3D model • To create my own digital 3D model	• 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.	TinkerCAD, 2D, 3D, shapes, select, move, perspective, view, handles, resize, lift, lower, recolour, rotate, duplicate, group, cylinder, cube, cuboid, sphere, cone, prism, pyramid, placeholder, hollow, choose, combine, construct, evaluate, modify.

Programming Making Quizzes	Exploring selection in programming to design and code an interactive quiz.	• To explain how selection is used in computer programs • To relate that a conditional statement connects a condition to an outcome • To explain how selection directs the flow of a program • To design a program which uses selection • To create a p • uses selection • To evaluate my program	• 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	Selection, condition, true, false, count-controlled loop, outcomes, conditional statement, algorithm, program, debug, question, answer, task, design, input, implement, test, run, setup, operator

Oak – Year B

Learning Unit	Unit summary	Objectives	Link to the National Curriculum	Vocabulary
Online Safety	Children will learn what not to say or do online so that is does not damage their online reputation. They learn how to protect their online information using passwords and ask an adult if they find themselves in a tricky situation. They learn how to make good decisions when online and how to be kind to others. Finally, they understand what they can do if they see something that upsets them or makes them feel uncomfortable when online.	• What is a digital footprint? • Why do I need a strong password? • Why should I keep personal information private online? • How can I build positive and healthy online relationships? • What do I do if I see upsetting material online or experience cyber bullying?	• To 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	Malicious, phishing, scam, authentic, online privacy, personal information, digital footprint
Code.org	**Functions in Minecraft** Children will recognize reusable patterns and be able to incorporate named blocks to call pre-defined functions. **Functions with Harvester** Children will use conditionals with functions to harvest crops in Harvester.	• Use functions to simplify complex programs. • Use pre-determined functions to complete commonly repeated tasks. • Recognize when a function could help to simplify a program. • Use pre-determined functions to complete commonly repeated tasks.	• 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	Function, variable, prompt

	Text and Prompts Children store and retrieve values without changing them. In later lessons, they will store numerical values and modify them over time to keep track of things like a player's score in a game.	• Actions Use variables to hold words and phrases. • Use variables in conjunction with prompts.	• use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	
Programming Scratch Doom on a Broom	Using Scratch, children follow a series of instructions to create a game in which a witch is riding her broomstick in the woods when creatures of the night begin to advance on her from all sides. She must cast her fireball spell to dispose of the bats, ghosts, ghouls and dragons that have taken a fancy to her for dinner.	• Setting the scene - start by putting together the Witch sprite, a dark wood and some creepy music. • Controlling the witch – adding script to take control of the witch (cast fireballs) • Bat attack – adding clones to make a hole squadron of bats. To add explosions – this will make the witch go out with a bang by creating some fireworks adding a scream, and updating the counter that shows how many lives she has left. • Speedy Spectre – adding a different type of bat • Fire-breathing dragon – instead of flapping straight towards the witch, it will spiral in slowly, giving her more time to defend herself • Ghost – add ghosts and ghouls to chase the witch, instead of vanishing when fireballs hit them, the ghosts will fade away. • Finishing touches – adding a game over, that appears when the witch runs out of lives. You can also program the witch to give instructions to the players at the start of the game. Play the game.	• 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; and the opportunities they offer for communication and collaboration • use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • 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.	Algorithm, Backdrop, Block, Debug, Event, Operator, Script, Sprite, Stage, Variable,
Programming Sensing Movement	Designing and coding a project that captures inputs from physical devices.	• To create a program to run on a controllable device • To explain that selection can control the flow of a program • To update a variable with a user input • To use a conditional statement to compare a variable to a value • To design a project that uses inputs and outputs on a controllable device • To develop a program to use inputs and outputs on a controllable device	• 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	Micro:bit, MakeCode, input, process, output, flashing, USB, trace, selection, condition, if then else, variable, random, sensing, accelerometer, value, compass, direction, navigation, design, task, algorithm, step

			goals, including collecting, analysing, evaluating and presenting data and information	counter, plan, create, code, test, debug.
Computer Networks and Search Engines Communication and Collaboration	Exploring how data is transferred by working collaboratively online.	• To explain the importance of internet addresses • To recognise how data is transferred across the internet • To explain how sharing information online can help people to work together • To evaluate different ways of working together online • To recognise how we communicate using technology • To evaluate different methods of online communication	• design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • 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	communication, protocol, data, address, Internet Protocol (IP), Domain Name Server (DNS), packet, header, data payload, chat, explore, slide deck, reuse, remix, collaboration, internet, public, private, oneway, two-way, one-to-one, one-to-many.
Inkscape	To develop an appreciation of the links between geometry and art. become familiar with the tools and techniques of a vector graphics package develop an understanding of turtle graphics experiment with the tools available, refining and developing their work as they apply their own criteria to evaluate it and receive feedback from their peers develop some awareness of computer-generated art, in particular fractal-based landscapes.	• To create simple tessellations using Inkscape? • Who is Maurits Escher? To create more complex tessellations using Inkscape. • Patterns used in geometric Islamic-style art. • To use Inkscape to create art in the later style of Bridget Riley • To use Inkscape to create art in the early style of Bridget Riley (optical art) • To create computer-generated landscapes in Terragen Classic	• 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.	fractal landscapes, sequence, repetition, Vector debugging, 'Op Art' geometric, symmetry tessellation