Computing Curriculum Progression

Purpose: A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

	Key Stage 1		Key Stage 2			
	Hedgehog (Y1)	**Fox (Y2)**	**Badger (Y3)**	**Otter (Y4)**	**Robin (Y5)**	**Deer (Y6)**
Breadth of Study	Technology around us Digital painting Digital writing Grouping data Moving a robot Introduction to animation	IT around us Digital photography Making music Pictograms Robot algorithms An introduction to quizzes	Connecting computers Animation Desktop publishing Branching databases Sequence in music Events and actions	The Internet Audio editing Photo editing Data logging Repetition in shapes Repetition in games	Sharing information Vector Drawing Video Editing Flat-file databases Selection in physical computing Selection in quizzes	Communication 3D Modelling Web page creation Spreadsheets Variables in games Sensing
Knowledge and Understanding	**Technology around us** 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	**IT around us** 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	**Connecting computers** To explain how digital devices function. To identify input and output devices. To recognise how digital devices can change the way that we work. To explain how a computer network can be used to share	**The Internet** 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. To describe how	**Sharing information** 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.	**Communication** 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

	responsibly. **Digital painting** 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. **Digital writing** 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. **Grouping data** To label objects. To identify that objects	helps us To explain how to use information technology safely. To recognise that choices are made when using information technology. **Digital photography** 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. **Making music** 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. To create music for a purpose. To review and refine our computer work.	information. To explore how digital devices can be connected. To recognise the physical components of a network. **Animation** 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. **Desktop publishing** To recognise how text and images convey information. To recognise that text and layout can be edited. To add content to a desktop publishing publication. To choose appropriate page	content can be added and accessed on the World Wide Web. To recognise how the content of the WWW is created by people. To evaluate the consequences of unreliable content. **Audio editing** 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. To apply audio editing skills independently. To combine audio to enhance my podcast project. To evaluate the effective use of audio. **Photo editing** To explain that the composition of digital images can be changed. To explain that colours can be changed in digital images. To explain how cloning can be used in photo editing. To explain that images	To recognise why the order of results is important, and to whom. **Vector Drawing** To identify that drawing tools can be used to produce different outcomes. To create a vector drawing by combining shapes. To use tools to achieve a desired effect. To recognise that vector drawings consist of layers of objects. To group objects to make them easier to work with. To apply what I have learned about vector drawings. **Video Editing** To explain what makes a video effective. To use a digital device to record video. To capture video using a range of techniques. To create a storyboard. To identify that video can be improved through reshooting and editing. To consider the impact of the choices made	ways of working together online. To recognise how we communicate using technology. To evaluate different methods of online communication. **3D Modelling** 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. **Web page creation** To review an existing website and consider its structure. To plan the features of a web page. To consider the ownership and use of images. To recognise the need to preview pages. To outline the need for

	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. **Moving a robot** 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. **Introduction to animation** 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	**Pictograms** 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. **Robot algorithms** 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.	settings. To consider how different layouts can suit different purposes. To consider the benefits of desktop publishing. **Branching databases** To create questions with yes/no answers. To identify the attributes needed to collect data about an object. To create a branching database. To explain why it is helpful for a database to be well structured. To plan the structure of a branching database. To independently create an identification tool. **Sequence in music** To explore a new programming environment. To identify that commands have an outcome. 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	can be combined. To combine images for a purpose. To evaluate how changes can improve an image. **Data logging** 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. **Repetition in shapes** To identify that accuracy in programming is important. To create a program in a text-based language. To explain what 'repeat' means. To modify a	when making and sharing a video. **Flat-file databases** 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. To explain that tools can be used to select specific data. To use a real-world database to answer questions. **Selection in physical computing** To control a simple circuit connected to a computer. To write a program that includes count-controlled loops. To explain that a loop can stop when a condition is met. To explain that a loop can be used to repeatedly check whether a condition has been met. To design a physical project that includes selection.	a navigation path. To recognise the implications of linking to content owned by other people. **Spreadsheets** 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. **Variables in games** 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. **Sensing**

Computing Curriculum Progression

	To design the parts of a project. To use my algorithm to create a program.	**An introduction to quizzes** 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**.**	project. To create a project from a task description. **Events and actions** 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.	count-controlled loop to produce a given outcome. To decompose a task into small steps. To create a program that uses count-controlled loops to produce a given outcome. **Repetition in games** 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.	To create a program that controls a physical computing project. **Selection in quizzes** To explain how selection is used in computer programs. To relate that a conditional statement connects a condition to an outcome. To design and create a program that uses selection.	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.
Threshold Concepts	Computing systems Coding Creating media Effective use of tools	Computing systems Networks Creating media Effective use of tools	Computing systems Networks Creating media Effective use of tools	Computing systems Networks Creating media Effective use of tools	Computing systems Networks Creating media Effective use of tools	Computing systems Networks Creating media Effective use of tools

Computing Curriculum Progression

	Data and Information Design and Development Staying Safe	Coding Data and Information Design and Development Staying Safe	Coding Design and Development Data and Information Staying Safe	Coding Design and Development Data and Information Staying Safe	Coding Design and Development Data and Information Staying Safe	Coding Design and Development Data and Information Staying Safe
Vocabulary	**Technology around us** Technology, computer, mouse, trackpad, keyboard, screen, trackpad, double-click, typing **Digital painting** Paint program, tool, paintbrush, erase, fill, undo,Piet Mondrian, primary colours, shape tools, line tool, fill tool, undo tool, Henri Matisse, shape tool, fill tool, Wassily Kandinsky, tools, feelings, colour, brush style, Georges Seurat, pointillism, brush size, pictures, painting, computers, like, prefer, dislike	**IT around us** Information technology (IT), computer, barcode, scanner/scan **Digital photography** Device, camera, photograph, capture, image, digital, landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, format, lighting **Making music** Music, planets, Mars, Venus, war, peace, quiet, loud, feelings, emotions, pattern, rhythm, pulse, Neptune, pitch, tempo, notes, notes,	**Connecting computers** Digital device, input, process, output program, digital, non-digital, connection, network, network switch, server, wireless access point, network cables, network sockets **Animation** Animation, flip book, stop-frame animation, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency, evaluation, delete, media, import, transition **Desktop publishing**	**The Internet** Internet, network, router, network security, network switch, server, wireless access point (WAP), website, web page, web address, routing, web browser, World Wide Web, content, links, files, use, content, download, sharing, ownership, permission, information, sharing, accurate, honest, content, adverts **Audio editing** Audio, microphone, speaker, headphones, input device, output device, sound, podcast, edit, trim, align, layer, import, record,	**Sharing information** System, connection, digital, input, process, output, system, connection, digital, input, process, output, search engine, refine, Index, crawler, bot, web crawler, content creator, selection, ranking **Vector Drawing** Vector, drawing tools, object, toolbar, move, resize, colour, rotate, duplicate/copy, zoom, select, rotate, align, resize, modify, layers,	**Communication** Communication, protocol, data, address, Internet Protocol (IP) address, Domain Name Server (DNS), packet, header, data payload, chat, explore, slide deck, reuse, remix, collaboration, internet, public, private, one-way, two-way, one-to-one, one-to-many **3D Modelling** 2D, 3D, shapes, select, move, perspective, view, handles, resize, lift, lower, recolour, rotate, duplicate, group, cylinder, placeholder, hollow, choose,

Computing Curriculum Progression

	Digital writing Word processor, keyboard, keys, letters, type, numbers, space, backspace, text cursor, capital letters, toolbar, bold, italic, underline, mouse, select, undo, redo, font, format, compare, typing **Grouping data** Object, search, image, property, label, colour, size, shape, group, value, data set, more, less, most, fewest **Moving a robot** Forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, turn, plan, algorithm, program, route **Introduction to animation** ScratchJr, Bee-Bot, command, sprite, compare, programming, programming area, block, joining,	instrument, tempo, create, pulse/beat, instrument, rhythm **Pictograms** More than, less than, most, least, organise, data, object, tally chart, votes, total, pictogram, enter, data, compare, common, least common, attribute, conclusion **Robot algorithms** Instruction, sequence, clear, unambiguous, algorithm, program, order, prediction, program, artwork, design, route, mat, debugging, decomposition **An introduction to quizzes** Sequence, command, program, run, start, outcome, predict, blocks, sprite, algorithm, blocks, design, actions, project, design, modify, change, build, match, compare,	Text, images, advantages, disadvantages, communicate, font, font style, template landscape, portrait, orientation, placeholder, layout, content, desktop publishing, copy, paste **Branching databases** Attribute, value, questions, table, objects, branching database, database, equal, even, separate, structure, compare, order, organise, decision tree **Sequence in music** Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide,sequence, event, task, design, code, run the code, design, algorithm, bug, debug **Events and actions**	playback, edit, selection,, load, import, save, export, MP3, editing, evaluate, feedback **Photo editing** Image, edit, digital, crop, rotate, undo, save, adjustments, effects, colours, hue, saturation, sepia, vignette, retouch, clone, select, copy, paste, combine, made up, real, composite, cut, alter, background, foreground, rotate, crop, zoom, clone, select, undo, font **Data logging** Data, table, layout, input device, sensor, data logger, logging, data point, interval, analyse, data set, import, export, logged, collection, review, conclusion **Repetition in shapes** Program, turtle, commands, code snippet, algorithm	order, Copy, paste, group, ungroup, duplicate, object, vector drawing, reuse, **Video Editing** **Flat-file databases** **Selection in physical computing** **Selection in quizzes**	combine, construct, evaluate, modify **Web page creation** Website, web page, browser, media, Hypertext Markup Language (HTML), logo, layout, header, media, purpose, copyright, fair use, home page, preview, evaluate, device, Google Sites, breadcrumb trail, navigation, hyperlink, subpage, evaluate, implication, external link, embed **Spreadsheets** Data, collecting, table, structure, spreadsheet, cell, cell reference, data item, format, formula, calculation, input, output, data, calculate, operation, formula, range, duplicate, sigma, question, organised, formula, chart, evaluate, results, comparison, questions, software, tools **Variables in games**

	command, **Start** block, run, program, background, delete, reset, algorithm, predict, effect, change, value, instructions, delete, program	debug,features, evaluate	Motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, pen, design, event, action, debugging, errors, setup, design, code, setup, test, debug, actions, events	design, debug, logo, Pattern, repeat, repetition, count-controlled loop, algorithm, value, repeat, repetition, count-controlled loop, trace, value, repeat, count-controlled loop, decompose, procedure **Repetition in games** Scratch, programming, sprite, blocks, code, loop, repeat, value, block, forever, infinite loop, count-controlled loop, costume, modify, design, repetition, design, sprite, algorithm, duplicate, debug, refine, evaluate		Variable, change, name, value, set, design, event, algorithm, code, task, artwork, program, project, code, test, debug, improve, evaluate, share **Sensing** 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 counter, code, test, debug