Wrockwardine Wood CE Junior School

Computing Progression Document

Curriculum area	Year 3	Year 4	Year 5	Year 6
Unit 1 **Computing systems and networks**	**Connecting** **computers** **Learners will develop their understanding of digital devices, with an initial focus on inputs, processes, and outputs.** They will be able to compare digital and non-digital devices. **Next, learners will be introduced to computer networks, including devices that make up a network's infrastructure, such as wireless access points and switches. Finally, learners will discover the benefits of connecting devices in a network.** **Key vocabulary: Network, data, server, wireless access points (WAPs), network switch, router, process, output, Wi-Fi, Bluetooth.**	**Recognising the internet** **Learners will apply their knowledge and understanding of networks, to appreciate the internet as a network of networks which need to be kept secure. They will learn that the World Wide Web is part of the internet, and will be given opportunities to explore the World Wide Web for themselves in order to learn about who owns content and what they can access, add, and create.** Finally, they will be able to evaluate online content to decide how honest, accurate, or reliable it is, and understand the consequences of false information. **Key vocabulary: Network, data, World Wide Web, Internet, web page, website, content, media, copyright.**	**Sharing information** **In this unit, learners will develop their understanding of computer systems and how information is transferred between systems and devices.** Learners will be able to consider small-scale systems as well as large-scale systems. They can explain the input, output, and process aspects of a variety of different real-world systems. Learners will also take part in a collaborative online project with other class members and develop their skills in working together online. **Key vocabulary: Systems, transfer, input, output, process, collaboration.**	**Internet communication** **In this unit, the class will learn about the World Wide Web as a communication tool. First, they will learn how we find information on the World Wide Web, through learning how search engines work (including how they select and rank results) and what influences searching, and through comparing different search engines**. They will then investigate different methods of communication, before focusing on internet-based communication. Finally, they will be able to evaluate which methods of internet communication to use for particular purposes. **Key vocabulary: Address bar, search box, World Wide Web, search engine, web crawler, page rank, ranking, communication, search terms.**
Unit 2 **Creating media** Key vocabulary: Network Data Wireless Access Points (WAP's) Network switch Router Input Process Output Wi-Fi Bluetooth	**Stop-frame** **animation** **Learners will learn specific techniques and vocabulary for creating stop-frame animation** and then will use a range of techniques to create a stop-frame animation using tablets. Next, they will apply those skills to create a story-based animation. This unit will conclude with learners being able to add other types of media to their animation, such as music and text. **Key vocabulary: Text, images, font, resize, orientation, portrait, landscape, placeholder, edit, template, layout, desktop publishing (DTP)**	**Audio editing** In this unit, learners will initially examine devices capable of recording digital audio, which will **include identifying the input device (microphone) and output devices (speaker or headphones) if available. Learners will discuss the ownership of digital audio and the copyright implications of duplicating the work of others.** In order to record audio themselves, learners will use Audacity to produce a podcast, which will include editing their work, adding multiple tracks, and opening and saving the audio files. Finally, learners will evaluate their work and give feedback to their peers. **Key vocabulary: Editing, input device, output device, copyright, audio file, Audacity.**	**Vector drawing** In this unit, learners start to create vector drawings. They learn how to use different drawing tools to help them create images. **Learners recognise that images in vector drawings are created using shapes and lines, and each individual element in the drawing is called an object.** Learners will be able to layer their objects and begin grouping and duplicating them to support the creation of more complex pieces of work. **Key vocabulary: Vector drawing, layer, group, modify, 2D objects.**	**3D modelling** **During this unit, learners will develop their knowledge and understanding of using a computer to produce 3D models. Learners will initially familiarise themselves with working in a 3D space, including combining 3D objects to make a house and examining the differences between working digitally with 2D and 3D graphics.** Learners will progress to making accurate 3D models of physical objects, such as a pencil holder, which include using 3D objects as placeholders. Finally, learners will examine the need to group 3D objects, then go on to plan, develop, and evaluate their own 3D model of a photo frame. **Key vocabulary: Perspective, 3D, digital tool, artefact, object, placeholder.**

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Unit 3 **Programming A**	**Sequencing sounds** **This unit explores the concept of sequencing in programming through Scratch. They will learn what selection of motion, sound, and event blocks mean** and will decide which they will use to create their own programs, featuring sequences. The final project is to make a representation of a piano. Learners also apply stages of program design through this unit. **Key vocabulary: Debug, sequence, decompose, selection, variables, outcomes, algorithms, programs, code, block-based coding, sprite, staging area, code block, run, event block, control blocks.**	**Repetition in shapes** **This unit is the first of the two programming units in Year 4, and allows learners to develop their understanding of repetition and loops within programming.** Pupils will create programs by planning, modifying, and testing commands to create shapes and patterns. They will use Logo, a text-based programming language. **Key vocabulary: Loops, count-controlled loops, infinite loops, repetition, algorithms, logo, input, output, text-based and block-based programming.**	**Selection in physical** **computing** Learners will use physical computing to **explore the concept** of selection in programming through the use of the Crumble programming environment. Learners will be introduced to a microcontroller and learn how to connect and program it to control components (including output devices — LEDs and motors). **Learners will be introduced to conditions as a means of controlling the flow of actions in a program.** Learners will make use of their knowledge of repetition and conditions when introduced to the concept of selection (through the 'if...then...' structure) and write algorithms and programs that utilise this concept. **Key vocabulary: Crumble controller, scratch, algorithm, sequence, selection (if. . . Then. . .statements, repetition, loop, count-controlled or infinite loop, conditional statement, LED, debug.**	**Variables in games** This unit explores the concept of variables in programming through games in Scratch. **First, pupils will learn what variables are, and relate them to real-world examples of values that can be set and changed.** Pupils will then use variables to create a simulation of a scoreboard. In Lessons 2, 3, and 5, which follow the Use-Modify-Create model, pupils will experiment with variables in an existing project, then modify them, then they will create their own project. In Lesson 4, pupils will focus on design. Finally, in Lesson 6, pupils will apply their knowledge of variables and design to improve their game in Scratch. **Key vocabulary: Sequence, selection, repetition, variable, program, algorithm, string, outcome, abstraction.**
Unit 4 **Data and information**	**Branching databases** During this unit, **learners will develop their understanding of what a branching database is and how to create one. They will gain an understanding of what attributes are and how to use them to sort groups of objects by using yes/ no questions.** The learners will create physical and on-screen branching databases. Finally, they will evaluate the effectiveness of branching databases and will decide what types of data should be presented as a branching database. **Key vocabulary: Branching database, attribute/ property,/yes/no questions, data, information.**	**Data logging** **In this unit, pupils will consider how and why data is collected over time. Pupils will consider the senses that humans use to experience the environment and how computers can use special input devices called sensors to monitor the environment.** Pupils will collect data as well as access data captured over long periods of time. They will look at data points, data sets, and logging intervals. Pupils will spend time using a computer to review and analyse data. Towards the end of the unit, pupils will pose questions and then use data loggers to automatically collect the data needed to answer those questions. **Key vocabulary: Sensor, data, information, data -logger, time-frame, input, output.**	**Flat-file databases** **This unit will teach pupils how a flat-file database can be used to organise data in records.** Pupils use tools within a database to order and answer questions about data. They create graphs and charts from their data to help solve problems. They use a real-life database to answer a question, and present their work to others. **Key vocabulary: Operand, data, information, selection, field, parameter, flat-file database.**	**Introduction to** **spreadsheets** **Learners will be supported in organising data into columns and rows to create their own data set. Learners will be taught the importance of formatting data to support calculations, while also being introduced to formulas and will begin to understand how they can be used to produce calculated data.** Learners will be taught how to apply formulas that include a range of cells, and apply formulas to multiple cells by duplicating them. Learners will use spreadsheets to plan an event and answer questions. Finally, learners will create graphs and charts, and evaluate their results in comparison to questions asked. **Key vocabulary: Data, spreadsheet, cell, formula, select, duplicate, input, output, column, row, format.**

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Unit 5 **Creating media**	**Desktop publishing** **Learners will 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 premade documents. **Learners will be introduced to the terms 'templates', 'orientation', and 'placeholders' and begin to understand how these can support them in making their own template for a magazine front cover.** They will start to add text and images to create their own pieces of work using desktop publishing software. **Key vocabulary: Layout, landscape, portrait, placeholders, font, style, edit, right click, left click, group/ungroup.**	**Photo editing** **In this unit, learners will develop their understanding of how digital images can be changed and edited, and how they can then be resaved and reused.** They will consider the impact that editing images can have, will be provided the opportunity to practice this and will then evaluate the effectiveness of their choices. **Key vocabulary: Image, filters, cropping, editing, composition, select, group, clone.**	**Video editing** Learners will learn how to create short videos by working in pairs or groups. **As they progress through this unit, they will be exposed to topic-based language** and develop the skills of capturing, editing, and manipulating video. **Learners are guided with step-by-step support to take their idea from conception to completion.** At the conclusion of the unit, learners have the opportunity to reflect on and assess their progress in creating a video. **Key vocabulary: Storyboard, panning, zooming, editing, filters, cropping, exporting.**	**Webpage creation** Learners will be introduced to creating websites for a chosen purpose. **Learners identify what makes a good web page and use this information to design** and evaluate their own website using Google Sites**.** Throughout the process, learners pay specific attention to copyright and fair use of media, the aesthetics of the site, and navigation paths. **Key vocabulary: Webpage, HTML, hyperlink, navigation pathway, header, links, copyright, fair use.**
Unit 6 **Programming B**	**Events and actions** **in programs** **This unit explores the links between events and actions, while consolidating prior learning relating to sequencing.** Learners begin by moving a sprite in four directions (up, down, left, and right). They then explore movement within the context of a maze, using design to choose an appropriately sized sprite. Learners are given the opportunity to draw lines with sprites and change the size and colour of lines. The unit concludes with learners designing and coding their own maze-tracing program. **Key vocabulary: Debug, sequence, decompose, selection, variables, outcomes, algorithms, programs, code, block-based coding, sprite, staging area, code block, run, event block, control blocks.**	**Repetition in games** **Learners will explore the concept of repetition in programming using the Scratch environment. The unit 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. **Key vocabulary: Repetition, indefinite, loop, sequence, algorithm, count-controlled, debug, sprite.**	**Selection in quizzes** **Pupils develop their knowledge of 'selection' by revisiting how 'conditions' can be used in programming, 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 represent this understanding in algorithms, and then by constructing programs using the Scratch programming environment. They learn how to write programs that ask questions and use selection to control the outcomes based on the answers given. They use this knowledge to design a quiz in response to a given task and implement it as a program. **Key vocabulary: Algorithm, sequence, repetition, selection, loop, condition, count-controlled loop, condition-controlled loop.**	**Sensing** The unit begins with a simple program for learners to build in and test in the programming environment. Learners then take on three new projects in Lessons 2, 3, and 4, with each lesson adding more depth. **A design template is introduced in Lesson 3, initially scaffolded to give learners the opportunity to create code from a given design.** In Lesson 4 that scaffolding is gradually reduced, then in Lesson 5, learners create their own design, using the same template. In the final lesson, learners will apply their knowledge of the programming constructs and use their design to create their own micro:bit-based step counter. **Key vocabulary: Program, coding, micro: bit, LED, count-controlled, loop, condition –controlled loop.**
Online safety focus (delivered at the start of every half term)	Cyberbullying Buying online Personal information Using email Communicating online Applying knowledge (Party planners)	Cyberbullying Safe searching Plagiarism and copyright Personal information Communicating online Applying knowledge (Cyber superheroes)	Spam Using citations Passwords Fake and edited images Secure sites Citations and copyright E-Safety (Review of knowledge)	Cyberbullying Secure websites People online Stereotypes SMARTbots Safety quiz for peers.

Key stage 1 Knowledge

National Curriculum Coverage — Key Stage 1 Computing Curriculum	1.1 Technology around us	1.2 Digital painting	1.3 Moving a robot	1.4 Grouping data	1.5 Digital writing	1.6 Programming animations	2.1 Information technology around us	2.2 Digital photography	2.3 Robot algorithims	2.4 Pictograms	2.5 Making music	2.6 Programming quizzes
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	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓
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	✓				✓	✓	✓			✓		

Lower Key stage 2 Knowledge

National Curriculum Coverage — Years 3 and 4	3.1 Connecting computers	3.2 Stop-frame animation	3.3 Sequencing sounds	3.4 Branching databases	3.5 Desktop publishing	3.6 Events and actions in programs	4.1 The Internet	4.2 Audio editing	4.3 Repetition in shapes	4.4 Data logging	4.5 Photo editing	4.6 Repetition in games
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							✓	✓			✓	

Upper Key stage 2 Knowledge

National Curriculum Coverage — Years 5 and 6	5.1 Sharing information	5.2 Video editing	5.3 Selection in physical computing	5.4 Flat-file databases	5.5 Vector drawing	5.6 Selection in quizzes	6.1 Internet communication	6.2 Webpage creation	6.3 Variables in games	6.4 Introduction to spreadsheets	6.5 3D modelling	6.6 Sensing
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	✓	✓						✓	✓		✓	

	Key Stage One		Lower Key Stage 2		Upper Key Stage 2	
Vocabulary	**Year 1:** • Log in • Log out • Avatar • Username • Password • Notification • Save • Sort • Data • Program • Bug • Debug • Computer • Algorithm • Animation • File • Font • Coding • Input • Cursor • Backspace • Delete • Columns • Rows	**Year 2 (in addition to previous vocabulary):** • Properties • Action • Code • Object • Repeat • Timer • When clicked • Search • Search engine • Internet • Sharing • Email • Attachment • Digital footprint • Copy and paste • Template	**Year 3 (in addition to previous vocabulary):** • Event • Output • Variable • Simulation • Selection • If • Blog • Website • Webpage • PEGI rating • Communication • Compose • Send • Formatting • Draft • CC • Simulation • Templates • Orientation • Placeholders	**Year 4 (in addition to previous vocabulary):** • Alert • Else • Flow chart • Virus • Cookies • Identity theft • Malware • Phishing • Plagiarism • Spam • Formula • Bold • Italic • Underline • Stop motion • Frame • Video clip • Easter egg • CPU • RAM • Motherboard	**Year 5 (in addition to previous vocabulary):** • Sequence • Design • Online safety • Encryption • Reference • Network • System • Router • Package • Table • Perspective • Collaborate • Connection	**Year 6 (in addition to previous vocabulary):** • Tabs • Control • Screen time • Formula • Icon • Text based • Sprite • World Wide Web • LAN • WAN • Wireless • Bit • Byte • Kilobyte • Megabyte • Gigabyte • Tetrabyte