Brindley Heath Academy Computing Curriculum

Lower Key Stage 2

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Year 3	**Computing Systems and Networks - Connecting Computers** Challenge your learners to develop their understanding of digital devices, with an initial focus on inputs, processes, and outputs. Start by comparing digital and non-digital devices, before introducing them to computer networks that include network infrastructure devices like routers and switches.	**Creating Media - Animation** During this unit, learners 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 adding other types of media to their animation, such as music and text.	**Creating Media - Desktop Publishing** During this unit, 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. Learners will look at a range of page layouts thinking carefully about the purpose of these and evaluate how and why desktop publishing is used in the real world.	**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.	**Programming A - Sequence in Music** This unit explores the concept of sequencing in programming through Scratch. It begins with an introduction to the programming environment, which will be new to most learners. They will be introduced to a selection of motion, sound, and event blocks which they will use to create their own programs, featuring sequences. The final project is to make a representation of a piano. The unit is paced to focus on all aspects of sequences, and make sure that knowledge is built in a structured manner. Learners also apply stages of program design through this unit.	**Programming B - Events and Actions** This unit explores the links between events and actions, whilst consolidating prior learning relating to sequencing. Learners will begin by moving a sprite in four directions (up, down, left and right). They will then explore movement within the context of a maze, using design to choose an appropriately sized sprite. This unit also introduces programming extensions, through the use of pen blocks. 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.
Year 4	**Computing Systems and Networks - The Internet** During this unit 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 be given opportunities to explore the World Wide Web for themselves to learn about who owns content and what they can access, add, and create. Finally they will evaluate online content to decide how honest, accurate, or reliable it is, and understand the consequences of false information.	**Creating Media - 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.	**Creating Media - 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, and evaluate the effectiveness of their choices.	**Data and 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.	**Programming A - Repetition in Shapes** This unit is the first of the two programming units in Year 4, and looks at 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.	**Programming B - Repetition in Games** This unit explores the concept of repetition in programming using the Scratch environment. It begins with a Scratch activity similar to that carried out in Logo in Programming unit A, where learners can discover similarities between two environments. Learners look at the difference between count-controlled and infinite loops, and use their knowledge to modify existing animations and games using repetition. Their final project is to design and create a game which uses repetition, applying stages of programming design throughout.

Upper Key Stage 2

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Year 5	**Computing Systems and Networks - Sharing Information** In this unit, learners will develop their understanding of computer systems and how information is transferred between systems and devices. Learners will consider small-scale systems as well as large-scale systems. They will 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.	**Creating Media - Vector Drawing** In this unit learners will find out that vector images are made up of shapes. They will learn how to use the different drawing tools and how images are created in layers. They will explore the ways in which images can be grouped and duplicated to support them in creating more complex pieces of work. This unit is planned using the Google Drawings app other alternative pieces of software are available.	**Creating Media - Video Editing** This unit gives learners the opportunity to learn how to create short videos in 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. Active learning is encouraged through guided questions and by working in small groups to investigate the use of devices and software. Learners are guided with step-by-step support to take their idea from conception to completion. At the teacher's discretion, the use of green screen can be incorporated into this unit. At the conclusion of the unit, learners have the opportunity to reflect on and assess their progress in creating a video.	**Data and Information - Flat-File Databases** This unit looks at 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.	**Programming A - Selection in Physical Computing** In this unit, 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 (Crumble controller) and learn how to connect and program components (including output devices- LEDs and motors) through the application of their existing programming knowledge. Learners are introduced to conditions as a means of controlling the flow of actions and explore how these can be used in algorithms and programs through the use of an input device (push switch). Learners 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. To conclude the unit, learners design and make a working model of a fairground carousel that will incorporate their understanding of how the microcontroller and its components are connected and how selection can be used to control the operation of the model. Throughout this unit, pupils apply the stages of programming design.	**Programming B - Selection in Quizzes** In this unit, pupils develop their knowledge of selection by revisiting how conditions can be used in programs and then learning how the If… Then… Else structure can be used to select different outcomes depending on whether a condition is true or false. They 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 answer given. They use this knowledge to design a quiz in response to a given task and implement it as a program. To conclude the unit, learners evaluate their program by identifying: how it meets the requirements of the task; the ways they have improved it; further ways it could be imed dproved.
Year 6	**Computing Systems and Networks - The Internet** During this unit 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 be given opportunities to explore the World Wide Web for themselves to learn about who owns content and what they can access, add, and create. Finally they will evaluate online content to decide how honest, accurate, or reliable it is, and understand the consequences of false information.	**Creating Media - 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.	**Creating Media - Web-page Creation** This unit introduces learners to the creation of 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.	**Data and Information - Spreadsheets** This unit introduces the learners to spreadsheets. Learners are supported in organising data into columns and rows to create their own data set. They are taught the importance of formatting data to support calculations. Learners are introduced to formulas and begin to understand how these can be used to produce calculated data. They are taught how to apply formulas which include a range of cells and apply formulas to multiple cells by duplicating them. Learners use spreadsheets to plan an event and answer questions. Finally learners create graphs and charts and evaluate their results in comparison to questions asked.	**Programming A - 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.	**Programming B - Sensing** This unit is the final KS2 programming unit and brings together elements of all the four programming constructs: sequence from year 3, repetition from year 4, selection from year 5 and variables, introduced in year 6, programming A. It offers learners the opportunity to use all of these constructs in a different, but still familiar environment whilst also utilising a physical device - the micro:bit. The unit begins with a simple program which learners build in and test in the programming environment before transferring it to their micro:bit. Learners then take on three new projects in lessons 2, 3 and 4, with each lesson adding more depth. Design features prominently in this unit. 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.

Brindley Heath Academy Online Safety Scheme of Work

National curriculum in England – Online Safety links with Computing

Purpose of study

Computing 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.

The national curriculum for computing aims to ensure that all pupils:

- Are responsible, competent, confident and creative users of information and communication technology.

Subject content - Key Stage 1

Pupils should be taught to:

- 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.

Subject content - Key Stage 2

Pupils should be taught to:

- Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.
- Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Brindley Heath Academy Online Safety Scheme of Work

Online Safety Overview - Adapted from SWGfL

https://digital-literacy.org.uk/curriculum-overview.aspx/

	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5
Year 3	Passwords	Online Community Communication Online	Communication Online	Showing Respect Online	E-mail Communication
Year 4	Online identity Communication Online	Being a digital citizen online Communication Online	Cyberbullying	Keywords	Digital Citizens
Year 5	Strong Passwords	Social Media Communication Online	Online Presence Communication Online	Online Time/Gaming Communication Online	Online Community/Digital Citizens Communication Online
Year 6	Talking Safely Online Communication Online	Privacy Rules/Social Media Communication Online	Online Time/Gaming Communication Online	Cyberbullying	Stereotypes

- Online safety is 'drip-fed' throughout the year as opposed to taught in a single block of lessons.
- Whilst online safety themes are discussed during Computing units, discrete online safety lessons are taught each half term adapted from the SGWfL scheme of work *(see individual year group plans)*
- The school Computing Lead also leads 3 eSafety related whole school assemblies each year (1 per term)