



South Gosforth First School Computing – Year 4 Long Term Plan



Purpose of Study

At South Gosforth First School, our computing curriculum enables pupils to develop the computational thinking, creativity and confidence they need to understand and engage with an increasingly digital world. Rooted in the National Curriculum, our approach reflects the school's commitment to providing rich, ambitious and meaningful learning experiences from Early Years through to Year 4.

Computing at South Gosforth has strong connections with mathematics, science, and design and technology. At its core is computer science: pupils learn the fundamental principles of information, algorithms and logic, how digital systems operate, and how to apply this knowledge by designing, writing and debugging their own programs. Through carefully sequenced units informed by NCCE, code.org and iLearn2, pupils develop a secure and age-appropriate understanding of how technology works.

Building on this foundation, pupils use information technology purposefully to create digital content, solve problems, and communicate their ideas. They learn to select appropriate tools, use devices safely and effectively, and understand how technology supports their learning across the curriculum.

A central aim of computing at South Gosforth First School is to ensure that pupils become digitally literate—able to use technology confidently, responsibly and creatively. Pupils learn how to express themselves, collaborate with others, and begin to understand their place within an online world. Our curriculum prepares them not only for the next stage of their education, but also to participate safely and thoughtfully in a digital society.

Aims

In line with the National Curriculum for Computing it is our aim to ensure that all pupils:

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



Autumn 1	Programming - Code.org (Course E)	
Character Culture Creativity Challenge	Prior Learning Pupils are building on the course D programming unit that they completed in year 3. As a result of that they have developed their understanding of events and interactive programming through creative tools. They are familiar with event blocks, building simple interactive musical sequences. They have experience of applying events to control characters, link inputs to on-screen actions, and debug simple game behaviours.	
	Key Learning Intentions To create and control a sprite using a block-based programming environment. To use events to make a program respond to user input. To create a simple digital project using sprites and events. To design a simple game using sprite behaviours and events. To use variables to store and change information in a program. To design a program with different sprite roles and purposes.	
	Overview of Computing Knowledge In this unit, pupils develop their understanding of block-based programming using Sprite Lab. They learn how to create and control sprites using sequences and events, before applying these skills in a short creative project. Pupils are introduced to game design through behaviours, events and variables, learning how programs respond dynamically to user input. They explore the roles of different sprites within a program, such as players and environments, and practise organising and refining their code. Across the unit, pupils strengthen problem-solving, creativity and logical reasoning as they design purposeful digital content.	Key Vocabulary Modify, event, loop, behaviour, condition, conditional, variable
	Milestones of Learning	
	To create and control a sprite using a block-based programming environment.	Pupils are introduced to Sprite Lab and learn how to add and customise sprites. They use blocks to make sprites appear and perform simple actions. This lesson introduces core programming concepts and encourages pupils to explore how instructions control on-screen objects through sequencing.
	To use events to make a program respond to user input.	Pupils learn how events trigger actions in a program. Using Sprite Lab, they create programs where sprites respond to clicks or key presses. The lesson builds understanding of interaction in programs and helps pupils see how games and apps respond to users in real time.
	To create a simple digital project using sprites and events.	Pupils design a short project that represents a career journey using Sprite Lab. They combine sprites, backgrounds and events to communicate ideas. This lesson links computing to real-world careers and reinforces creativity, combining technical skills with purposeful design.
	To design a simple game using sprite behaviours and events.	Pupils explore how sprite behaviours automate actions within a game. They apply events and behaviours to create simple game mechanics, such as movement or



		interaction. The lesson deepens understanding of cause and effect within programs and supports structured problem-solving
	To use variables to store and change information in a program.	Pupils are introduced to variables and learn how they can be used to keep score in a game. They practise changing values as events occur, linking actions to outcomes. This lesson strengthens understanding of data within programs and how information can change dynamically
	To design a program with different sprite roles and purposes.	Pupils create games with distinct sprite types, such as players and environments. They consider how each sprite functions within the program and organise their work accordingly. The lesson reinforces decomposition by breaking a game into manageable components.
	Online Safety PSHE Lessons: Online Relationships How can I be a good friend on and offline? Recognise the features of positive healthy friendships such as mutual respect, trust and sharing interests Develop strategies to build positive friendships Know how to seek support with relationships if they feel lonely or excluded. Be able to communicate respectfully with friends when using digital devices.	

Autumn 2	E-book Creation (Book Creator)	
Character Culture Creativity Challenge	Prior Learning This unit builds on the units in years 2 and 3 where children have had experience of using book creator. They are familiar with planning content and formatting text and images to improve the clarity and consistency of style. They are beginning to be able to develop layout skills and make choices that support readability and accuracy.	
	Key Learning Intentions To use a variety of software	
	Overview of Computing Knowledge This unit extends pupils' skills by introducing digital design principles and interactive features. Pupils plan and create an eBook for a specific audience, using more advanced tools such as hyperlinks, embedded audio/video, and interactive navigation buttons. They learn about effective digital layout, including spacing, contrast and accessibility. Pupils evaluate and refine their work to ensure it is clear, engaging and purposeful. By the end of the unit, they can combine a range of media and interactive elements to produce a polished, structured digital publication that demonstrates control, creativity and audience awareness.	Key Vocabulary Hyperlink, embed, navigation buttons, consistency



	Milestones of Learning	
	To use technology to design and create content that accomplishes a specific goal	Pupils explore examples of interactive eBooks and identify features such as hyperlinks, audio buttons and navigation pages. They discuss how interactivity improves the reader's experience. Pupils then choose a topic and audience (e.g. younger pupils) and plan their own eBook, including a contents page and page ideas.
	To present information effectively	Pupils design the structure of their pages, focusing on readability and presentation. They apply consistent fonts, headings and colour choices. Pupils begin adding text content and visual elements, ensuring that pages are accessible and visually appealing.
	To combine and manipulate a range of content	Pupils make their books interactive by adding hyperlinks between pages, such as a contents page linking to sections and a "back to contents" button. They add audio narration or short videos to enhance meaning and engagement.
	To combine and manipulate a range of content	Pupils review their eBooks for clarity, accuracy and ease of navigation. They test interactive features and make improvements based on feedback from peers. Pupils focus on proofreading text, checking links and refining media choices.
	To evaluate digital content	Pupils finalise and publish their eBooks, sharing them with their intended audience. They reflect on how interactivity improved their book and evaluate what they would change or develop next time.
Online Safety PSHE Lessons: Self image and identity Online Reputation Online Bullying Understand how knowing someone online differs from knowing someone face to face and that there are risks in communicating with someone they don't know. Know what to do or whom to tell if they are worried about any contact online. Be able to differentiate between playful teasing, hurtful behaviour and bullying, including online		



Spring 1	3D Design (iLearn2)	
Character Culture Creativity Challenge	Prior Learning Pupils are familiar with combining text and images to produce digital content. They are familiar with using apps on the ipads for their text and images but haven't yet explored desktop software. They are familiar with positioning and resizing images and choosing font style and size.	
	Key Learning Intentions To understand what 3D digital modelling is and how it is used in the real world. To create a simple 3D model using basic shapes and editing tools. To modify a 3D model by rotating, scaling and aligning objects accurately To design a 3D model that meets the requirements of a design brief. To refine a 3D model by evaluating and improving its design. To explain design choices and how a 3D model could be used in real life.	
	Overview of Computing Knowledge In this unit from ilearn2, pupils explore 3D design using digital software to plan, create and evaluate three-dimensional models. They learn how to manipulate shapes, combine and modify objects, and use tools such as scaling, grouping and rotation to refine their designs. Pupils develop an understanding of how digital 3D models are created and used in real-world contexts, including engineering, architecture and product design. Throughout the unit, pupils practise problem-solving and design thinking, evaluating their work against a brief and making improvements based on feedback.	Key Vocabulary Design brief, duplicate, align, group, scale, rotate
	Milestones of Learning	
	To understand what 3D digital modelling is and how it is used in the real world.	Pupils are introduced to 3D digital modelling and explore examples of how 3D designs are used in everyday life, such as buildings, products and games. They learn the difference between 2D and 3D objects and become familiar with the 3D design software interface, discussing how digital tools can be used creatively and purposefully.
	To create a simple 3D model using basic shapes and editing tools.	Pupils learn how to create basic 3D shapes using digital design software. They explore how shapes can be added, moved and edited on a workspace, developing confidence using tools independently. Pupils begin constructing a simple model by combining shapes, focusing on accuracy and organisation to produce a recognisable 3D object.
	To modify a 3D model by rotating, scaling and aligning objects accurately	In this lesson, pupils develop their skills by modifying existing 3D models. They practise rotating, scaling and aligning shapes to improve accuracy and appearance. Pupils learn how small adjustments can significantly improve a design and begin making purposeful design choices, linking tool selection to the outcome they want to achieve.
	To refine a 3D model by evaluating and improving its design.	Pupils are introduced to a design brief and plan a 3D model to meet specific requirements. They consider purpose, audience and constraints before creating their design. This lesson emphasises thoughtful decision-making and applying learned skills to produce purposeful digital content that meets set criteria.



	To refine a 3D model by evaluating and improving its design.	Pupils evaluate their 3D models against the design brief and identify areas for improvement. They refine their designs by making changes to size, shape and layout, learning that digital work is iterative. Peer or teacher feedback is used to support improvement, reinforcing the importance of evaluating and refining digital content.
	To explain design choices and how a 3D model could be used in real life	In the final lesson, pupils present their completed 3D models and explain their design choices. They describe how their model meets the design brief and discuss possible real-world uses. Pupils reflect on the skills they have developed, strengthening their ability to articulate ideas and understand the impact of digital design.
	Online Safety Safer Internet Day Assembly and PSHE lesson on given theme.	

Spring 2	Photo Editing (NCCE)	
Character Culture Creativity Challenge	Prior Learning The children are familiar with using ipads to take photos and use the tools available on that device to make changes to lighting and focus. They have made simple edits to improve the photos they have taken. They have already used desktops to explore using images to publish documents.	
	Key Learning Intentions 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 can be combined To combine images for a purpose To evaluate how changes can improve an image	
	Overview of Computing Knowledge In this unit of work from NCCE, pupils develop their understanding of how digital images can be edited and manipulated for different purposes. They learn to use photo-editing tools to rotate, crop, recolour, clone and combine images, gradually building towards creating and evaluating their own final image project. Pupils consider how choices in editing affect meaning, mood and realism, and are introduced to the ethical implications of image manipulation. Throughout the unit, pupils apply their skills creatively, review their work against success criteria and use feedback to make improvements, developing confidence in creating and presenting digital media responsibly	Key Vocabulary Image, edit, crop, rotate, filter, colour, recolour, select, combine
	Milestones of Learning	
	To explain that the composition of digital images can be changed	Pupils will recap to the concept of editing images and discuss whether or not editing is ethical. They will go on to explore when we need to rotate and crop an image as well as how to use an image editor to make these changes. Pupils will then discuss image



		composition. Pupils will relate this to the role of a photographer, appreciating how this knowledge and skill helps them to effectively edit their photos in this way.
	To explain that colours can be changed in digital images	Pupils will look at the effect that different colours and filters can have on an image. They will choose appropriate effects to fit a scenario, and explain how they made their choices. They will then edit the images using different effects to suit two different scenarios. Pupils will relate this to the role of a photographer, appreciating how this knowledge and skill helps them to effectively edit their photos in this way.
	To explain how cloning can be used in photo editing	Pupils will be introduced to the cloning tool and its use in both changing the composition of a photo and photo retouching. They will see how parts of a photo can be removed or duplicated using cloning. Pupils will consider what parts of an image can be retouched and learn techniques to make this as unnoticeable as possible. Finally, they will consider when it is necessary to edit photographs in this way.
	To explain that images can be combined	Pupils learn how to use different tools to select areas of an image. Pupils then use copy and paste within one image and between two images to produce a combined image. Finally, Pupils will consider when it's appropriate to edit an image and discuss some of the ethics around retouching photos.
	To combine images for a purpose	Pupils will apply all the skills they have learnt in the unit so far. They will start by reviewing some images and considering what makes an image look real or made up. Pupils will then plan their own image. They will choose from a selection of images, open them and edit them to create their own project.
	To evaluate how changes can improve an image	Pupils will review the image that they created in Lesson 5. After they have reviewed their image, they will have the opportunity to make changes to their image based on their review. Pupils will then add text to their image to complete it as a publication.
	Online Safety PSHE Lessons Managing information online Understand that everything shared online has a digital footprint Know that search results are ordered based on the popularity of the website and that this can affect what information people access. Know that organisations can use personal information to encourage people to buy things Recognise what online adverts look like. Be able to compare content shared for factual purposes and for adverts. Understand why people might choose to buy or not buy something online e.g. from seeing an advert.	



Summer 1	Scratch Repetition in games (NCCE)	
Character Culture Creativity Challenge	Prior Learning This unit builds on the Scratch sequencing sounds that pupils did in Year 3. They are familiar with sequencing in programming by creating musical patterns using block-based coding using the web-based Scratch platform. They know that a sequence is a set of instructions executed in order, and know tyhat changes to sequence, timing, or repetition affect the outcome	
	Key Learning Intentions 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	
	Overview of Computing Knowledge This unit from NCCE explore the concept of repetition in programming using the Scratch environment. The unit begins with a Scratch activity where pupils discover similarities between two environments. Pupils will then 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, count controlled loops, infinite loops, events
	Milestones of Learning	
	To develop the use of count-controlled loops in a different programming environment	Pupils look at real-life examples of repetition, and identify which parts of instructions are repeated. Pupils then use Scratch, a block-based programming environment, to create shapes using count-controlled loops. They consider what the different values in each loop signify, then use existing code to modify and create new code, and work on reading code and predicting what the output will be once the code is run.
	To explain that in programming there are infinite loops and count-controlled loops	Pupils look at different types of loops: infinite loops and count-controlled loops. They practise using these within Scratch and think about which might be more suitable for different purposes.
	To develop a design that includes two or more loops which run at the same time	Pupils create designs for an animation of the letters in their names. The animation uses repetition to change the costume (appearance) of the sprite. The letter sprites will all animate together when the event block (green flag) is clicked. When they have designed their animations, the Pupils will program them in Scratch. After programming, Pupils then evaluate their work, considering how effectively they used repetition in their code.
	To modify an infinite loop in a given program	Pupils look at an existing game and match parts of the game with the design. They make changes to a sprite in the existing game to match the design. They then look at a



		completed design, and implement the remaining changes in the Scratch game. They add a sprite, re-use and modify code blocks within loops, and explain the changes made.
	To design a project that includes repetition	Pupils look at a model project that uses repetition. They then design their own games based on the model project, producing designs and algorithms for sprites in the game. They share these designs with a partner and have time to make any changes to their design as required.
	To create a project that includes repetition	Pupils build their games, using the designs they created in Lesson 5. They follow their algorithms, fix mistakes, and refine designs in their work as they build. They evaluate their work once it is completed, and showcase their games at the end
	Online Safety Project Evolve Health, wellbeing and lifestyle To identify times or situations when someone may need to limit the amount of time they use technology	

Summer 2	Micro:bits (micro:bit.org)	
Character Culture Creativity Challenge	Prior Learning Pupils are familiar in creating and using coding programmes for a purpose on ipads and laptops. They are familiar with sequences and loops and can debug and evaluate what they have created.	
	Key Learning Intentions To transfer code to micro:bits To apply coding skills to real world contexts To make simple control systems	
	Overview of Computing knowledge In this unit, from micro:bit.org, pupils work through a sequence of 6 projects that are an entry into using micro:bits. They will develop their use of core computing concepts through coding and making practical projects. Projects include a name badge, animation, using inputs and outputs to make an emotion badge, using sensors to make step counters, nightlights, and a rock, paper, scissors game.	Key Vocabulary Micro:bit, input, output, sensors, sequences, loops, transfer
	Milestones of Learning	
	To transfer code to a micro:bit	Name Badge project Pupils understand the micro:bit is a tiny computer which needs instructions in code to make it work. They use the MakeCode editor to create instructions in code that the micro:bit can understand and then transfer them to the micro:bit. Pupils will know the micro:bit has an LED display output which it can use to show words (as well as numbers and pictures).



	To use sequences and loops to create a simple animation	Beating heart project Pupils will understand that sequence and timing is important when making an animation. They will know that animations create an illusion of movement by showing a sequence of still images. They will code the micro:bit to show simple animations on its LED display output, using loops to make animations run longer using fewer instructions
	To use the micro:bit to make different outputs	Emotions badge project Pupils will code the micro:bit to make different outputs happen depending on different inputs. They will know that inputs and outputs involve the flow of data in and out of computers. Pupils will apply this knowledge using the micro:bit's button inputs and display output.
	To use the sensor input and order code	Step counter project Pupils will know how sensor inputs from the accelerometer can be used to detect movement, such as when a step is taken. They will understand that variables are used to keep track of the current step count and that the order of instructions is important: display the variable's value after updating it, not before.
	To know how logic, conditionals, input and output can combine to make a control system	Nightlight project Pupils will know how inputs, outputs, and computer code work together to make control systems. They will understand how logic (conditional 'if... then... else' instructions) is used to make different outputs happen depending on changes in data from a sensor. They will use 'forever' infinite loops to keep control systems responding to changes in the environment and practise testing and improving a project to make the nightlight work better in specific local lighting conditions
	Online Safety Project Evolve Privacy and Security To know strategies for keeping personal information private To know what the digital age of consent is	