To inspire confident learners who will thrive in a changing world.

Computing

Intent of study at Swinford School

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.

Aims

The national curriculum for computing aims 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.

Implementation

Computing is taught in blocks on a termly basis using the Teach Computing Scheme units. Over the course of the two-year rolling programme, the children will complete a wide range of units. This programme of work gives all teaching staff the confidence and the knowledge to best embed and cover every element of the computing curriculum. A variety of hardware and software is used to create stimulating and engaging lessons that challenge the pupil's computational thinking. This can mean doing lessons away for the computer. These activities are physical in nature and provide kinaesthetic experiences which help pupils understand abstract concepts and deepen learning. Every year group learns through units within the same four themes (computer systems and networks, creating media,

programming and data and information). This means that each of the themes are revisited regularly and pupils revisit each theme through a new unit that consolidate and builds on prior learning within that theme. This approach allows us to use a spiral curriculum, progressing skills and concepts from one year group to the next. Applications of online safety is implemented through Computing and PHSCE. Children have the opportunity to explore and respond to key issues such as digital communication, cyber-bullying, online safety, security, plagiarism and social media.

Impact

The computing curriculum at Swinford school will enable the children to develop:

- Competency and skills to stay safe while using the internet
- A strong understanding of how technology works
- Skills to express themselves and be creative using digital media.
- Be equipped to apply their skills in computing to different challenges

Assessment

The teacher assesses the learning during the lesson through questioning, quizzes and independent work. This is used to inform future lesson planning and teacher assessment. Every lesson includes formative assessment opportunities for teachers to use. These opportunities are listed in the lesson plan and are included to ensure that misconceptions are recognised and addressed if they occur. They vary from teacher observation or questioning, to marked activities. These assessments are vital to ensure that teachers are adapting their teaching to suit the needs of the pupils that they are working with, and you are encouraged to change parts of the lesson, such as how much time you Spend on a specific activity, in response to these assessments. The learning objectives and success criteria are introduced in the slides at the beginning of every lesson. At the end of every lesson, pupils are invited to assess how well they feel they have met the learning objectives using thumbs up, thumbs down, or thumbs sideways. When we assess, we want to ensure that we are assessing a pupil's understanding of computing concepts and skills, as opposed to their reading and writing skills. Therefore, we encourage observational assessment while pupils are still developing their literacy skills. We believe that this is the most reliable way to capture an accurate picture of learning.

Long term coverage

Computing	KS1		CO1	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
Computing	KS1		CO2	use technology purposefully to create, organise, store, manipulate and retrieve digital content
Computing	KS1		CO3	recognise common uses of information technology beyond school
Computing	KS1		CO4	understand the principles of programming
Computing	KS1		CO5	use logical reasoning to predict the behaviour of simple programs
Computing	KS1		CO6	use information technology to create and debug simple programs
Computing		KS2	CO7	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
Computing		KS2	CO8	design and debug programs that accomplish specific goals
Computing		KS2	CO9	use information technology to create and debug increasingly complex programs
Computing		KS2	CO10	use logical reasoning to detect and correct errors in programs
Computing		KS2	CO11	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
Computing		KS2	CO12	use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
Computing		KS2	CO13	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
Computing		KS2	CO14	use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

Online safety is very important to us, and so if we are made aware of issues with this, we may adapt our computing units to educate the children.

EYFS

A1	A2	A3	A4	A5	A6
Finding out about technology	Developing skills and curiosity	Programming		Technology around us Creating pictures	

Year A

	Autumn	Autumn	Spring	Summer
	Data and information	**E-Safety -Online gaming**	**Creating Media**	**Programming B**

Year 1/2	Aspect-Unit 4 Data and information Focus-Exploring object labels, then using them to sort and group objects by properties. Use tally charts to present data.		Aspect: Unit 5 Creating Media and Music Focus: Using a computer to create and format text, before comparing to writing non-digitally. Create musical compositions.	Aspect: Unit 6 Programming B animations and quizzes Focus: Designing and programming the movement of a character on screen & making an interactive quiz
Year 3/4	**Programming B** Aspect: Unit 6 Programming B Focus: Writing algorithms and programs that use a range of events to trigger sequences of actions.	**E-Safety-Online relationships & gaming**	**Creating Media** Aspect: Unit 5 Creating Media Focus: Creating documents and modifying text, images and page layouts for a specific purpose & images	**Data and Information** Aspect: Unit 4 Data and information Focus: Building and using branching databases to group objects using yes/no questions.
Year 5/6	**Programming B** Aspect: Unit 6 Programming B Focus: Exploring selection in programming to design and code an interactive quiz.	**E-Safety-Relationships & online views/checking content**	**Creating Media** Unit 5 Creating Media Focus: Planning, capturing, and editing video to produce a short film	**Data and information** Unit 4 Data and Information Focus: Using a database to order data and create charts to answer questions

Year B

	Autumn	Autumn	Spring	Summer
Year 1/2	**Computing Systems and Networks** Aspect- Unit 1 Technology around us Focus- recognising technology in school and using it responsibly.	**E Safety- sharing images**	**Creating Media** Aspect: Unit 2 Digital Painting Focus: Capturing and changing digital photographs for different purposes. Creating digital art.	**Programming A** Aspect Unit 3 Moving Robots Focus: Writing short algorithms and programs for floor robots, and predicting program outcomes & debugging programs
Year 3/4	**Computing Systems and Networks** Aspect: Unit 1 Technology around us	**E-Safety-Sharing personal data/live streaming**	**Programming A** Aspect: Unit 3 Programming A	**Creating Media** Unit 2 Creating Media - Audio production

	Focus: Identifying that digital devices have inputs, processes, and outputs, and how devices can be connected to make networks		Focus: Using a text-based programming language to explore count-controlled loops when drawing shapes & creating music	Focus: Desktop publishing Creating documents and modifying text, images and page layouts for a specific purpose.
Year 5/6	**Creating Media** Aspect: Unit 2 Creating media Focus: Introduction to vector graphics Creating images in a drawing program by using layers and groups of objects & 3D modelling	**E-Safety-Personal information/sharing videos/images** Unit 1 – Collaboration and Communication	**Programming A** Aspect: Unit 3 Programming A Focus: Exploring conditions and selection using a programmable microcontroller. Designing and coding a computer game.	**Programming** Aspect: Unit 7 Using the Micro:bit controller Focus: Programming a Micro:bit controller to create sports related recorders. Transition unit to Ks3
	E- Safety			

Progression

Please see the learning graphs on the Teach Computing scheme for more information about progression.

	Seals Year A	Seals Year B	Turtles Year A	Turtles Year B	Dolphins Year A	Dolphins Year B
Unit 1 Computing Systems and Networks		B1 Technology around us		B1 Connecting computers		B2 Communication and collaboration
Unit 2 & 5 – Creating Media	A3 media and music	B3- digital photos/ printing	A3 Desktop publishing	B4 Audio production	A3 Vector graphics	B1 Video design & creation
Unit 3 & 6 Programming	A4 Floor robot	B4- ScratchJr Quizzes	A1 Repetition in games	B3 Sequencing sounds	A1 Selection in quizzes	B3 Programming in games B4 Using micro:bit controller
Unit 4- Data and information	A1 grouping data and pictograms		A4 Branching Databases		A4 Introduction to spreadsheets	
E- Safety	See separate document Units-Covered_-Education-for-a-connected-world-document-breakdown (1).docx					

Key Takeaways

EYFS

A1	Finding out about technology	I know how to use the interactive whiteboard in the classroom to draw a picture. I know how to use the class ipad to draw a simple face.

		I can use the play button on the CD player to listen to music or a story.
A2	Developing skills and curiosity about how things work	I can use the rubber function to remove mistakes on the IWB. I can record my voice on a sound button. I know how to play it back so someone else can listen to it. I know about the technology that I use at home and how my name is personal information.
A3 **A4**	Programming – Bee Bots	I know what a Beebot is. I know how to make the Beebot go forwards and backwards. I know how to clear the Beebot memory.
A5 **A6**	Technology around us and creating media	I know the items in the classroom that are technology. I know things in my home that use technology. I can create a simple pattern using the iPad, and use more than one colour. I know how to write my name on the iPad and IWB.

Y1 and 2 - Seals

A1	Unit 4 data and information Grouping data & pictograms	I know how to match and label objects. I can find totals in a tally chart. I can group objects and count them. I can enter data and view as a pictogram. I can find and describe objects and understand why images are used on computers. I can create a pictogram. I can count objects which share a property. I can select objects by attribute and make comparisons. I can compare groups of objects. I can draw conclusions from the pictogram. I can answer questions about groups of objects. I can present information using a computer.
A2	E Safety	My identity is the things that are unique about me. Understand that we should keep personal things safe on the internet.
A3	Unit 5 Creating media and music	To know that a word processer can record words. That there are keys and letters on the keyboard. To know how to use Backspace to remove text, to locate the space keys. I can identify the toolbar and use bold, italic, and underline. I can make choices when changing text such as font and selecting a word by double clicking. I can double click, drag and undo changes to my text. I know how to make changes to my text on the computer and can explain the difference with using a pencil.

A4	Programming - Unit 3 Moving robots	To know how to use the direction command buttons, as well as the 'clear memory' and 'run program' buttons on a floor robot. To give directional instructions. I know how to use forwards and backwards commands in a sequence. I know how to combine four direction commands to make a sequence. I can plan and debug a simple program for the floor robot. I know how to use two different solutions to solve a single problem.

B1	Unit 1 Technology around us	Technology is something that is made by us to help us with something. I know and can identify the screen, mouse and keyboard on a computer. I know how to click and drag an object on screen I know how to type my name and save my work on computer. I know how to use the keyboard to edit my text. I can name some rules for keeping safe on a computer. Hold your device carefully. Stop using your device when someone is talking to you. Take turns with your partner. Use only the apps you have been asked to used. Don't share your passwords
B2	E Safety/sharing images	
B3	Unit 2 –digital printing	To know some aspects of taking a good photograph. To know that a photo can be portrait or landscape To take a photograph using a simple camera or device that has been set up in camera mode To identify some of the reasons why a photograph may be good or bad To experiment when taking photos with different light sources To identify a photo that has been enhanced using tools when asked questions To use different tools to change how a photograph looks.
B4	Unit 6 – Programming B quizzes	To plan a project including changing backgrounds To know that a sequence can be started using a variety of event blocks To know that a sequence has an outcome, and identify different programs that have the same outcome To know the backgrounds can be changed through the programming blocks To understand the role of the numbers on ScratchJr blocks Write and run a simple program with a start block, and an end block which changes the background

		Adapt a given design to create a program with multiple sprites and backgrounds which uses the blocks given in the example Create and program a quiz with at least two backgrounds which switch based on an action Identify errors in their program, and debug them

Year 3 and 4 – Turtles

A1	Unit 6 Programming B Repetition in games	I can explain the detail of the specific requirements of the task. I can choose relevant sprites and backdrops for a game. I know how to create an algorithm that includes show, hide, and move blocks. I know how to create an algorithm that includes relevant sound blocks. I know how to create additional sprites and copy code over to those sprites. I know how to modify their code for additional sprites. I know how to run their code and identify whether it meets the requirements of the task I can evaluate how successful they were in meeting the task requirements.
A2	E Safety & gaming	
A3	Unit 5 – creating media- desktop publishing	To recognise how text and images convey information and the advantages and disadvantages of each. To know how to use of the Return, Backspace, and Shift keys to edit and change text and layouts. To know the terms 'templates', 'orientation', and 'placeholders' within desktop publishing software and design the layout for a magazine. To know how to add images and text into the desktop publishing. To know the different choices of layouts and discuss the purposes for each of them. To evaluate the use of desktop publishing.
A4	Unit 4 – Data and information Branching databases	I know how to create yes/no question about a group of objects. I know how to arrange attributes onto a tree structure to sort objects. I know how to create a branching database using yes/no questions and test that it works. I can create a physical and computer based branching database and understand that effective yes/no questions about attributes are the key to it working effectively. I know that databases can be used in lots of real-world situations.

B1	Unit 1 Technology around us- Connecting computers	I know that input, process, and output are fundamental to digital devices. I know how to protect devices using secure passwords. I can identify and classify input and output devices. I can design a digital device. I can compare digital and non-digital devices.

		I can explain how computers are connected to other digital devices, e.g. computers through wires, tablets through Wi-Fi, and smartphones through mobile phone networks. I can explain the role of a switch, server, and wireless access point in a network. I can identify the network devices at school.
B2	E safety- sharing personal data/understanding the internet	I can explain that the internet is a network of networks. I know that the internet lets us view the World Wide Web and that the World Wide Web is part of the internet which contains websites and web pages. I know how websites are stored when uploaded to the WWW. I can identify the main parts of a website and know how to simply create one. I understand who owns content uploaded to the WWW and the need to think carefully about what is shared with others. I know that website content is created by people and not all of this is true, honest or accurate.
B3	Unit 3 – Programming A Sequencing Sounds	I can identify the objects in a Scratch project (sprites, backdrops). I can explain that objects in Scratch have attributes (linked to). I can recognise that commands in Scratch are represented as blocks. I can create commands to move a sprite. I can join blocks of code together to form a sequence for the start of a program. I can explain how ordering sequences of commands have different outcomes. To design and create their own project, including sequences, sprites with costumes, and multiple backdrops. I can copy code from one sprite to another to design a musical instrument.
B4	Unit 2 – Creating Media – Audio production	To know the input device (microphone) and output devices (speaker or headphones) are required to work with sound digitally. To know the ownership of digital audio and the copyright implications of duplicating the work of others. To know how to use Audacity to produce a podcast, which will include editing their work, adding multiple tracks, and opening and saving the audio files. Tol evaluate their work and give feedback to their peers.

Year 5 and 6 – Dolphins

A1	Unit 6 Programming B Selection in Quizzes	That programs can be created to produce a different outcome- including Scratch. To know that selection directs the flow of a program. To use an algorithm to implement their own design. To be able to design a simple program, test and debug it and evaluate their work.
A2	E safety- online privacy and security	
A3	Unit 5 – Creating Media Introduction to vector graphics	To know how to start to create vector drawings. To use different drawing tools to help them create images. I know how to create images in vector drawings are created using shapes and lines, and each individual element in the drawing is called an object. I know how to layer objects and begin grouping and duplicating them to support the creation of more complex pieces of work.
A4	Unit 4 Data and information- Introduction to spreadsheets	I know that a spreadsheet program can organise data. I can create a data set and organise it into columns and rows. I know about 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. I know how to apply formulas that include a range of cells and apply formulas to multiple cells by duplicating them. I know how to use spreadsheets to plan an event and answer questions. I can create charts and evaluate their results in comparison to questions asked.

B1	Unit 2 – Creating media- Video design	I know how to create short videos in groups. I know how to capture, edit and manipulating video. I can work collaboratively to investigate the use of devices and software. I can take my idea from conception to completion. I can use a green screen in the video. I can reflect on and discuss the progress in creating a video.
B2	E safety- images sharing videos Unit 1 -Communication and collaboration	To know how data is transferred over the internet. To know how to find out the website address, before they move on to the makeup and structure of data packets. To know how the internet facilitates online communication and collaboration by completing shared projects online and evaluate different methods of communication.

		To know how to communicate responsibly by considering what should and should not be shared on the internet.
B3	Unit 3 – Programming A Variables in games	I can explain the concept of variables in programming through games in Scratch. I know what variables are and relate them to real-world examples of values that can be set and changed. I can use variables to create a simulation of a scoreboard. I can follow the Use-Modify-Create model to experiment with variables in an existing project, then modify them, before they create their own project. I can design and improve a game that I have designed in Scratch.
B4	Unit 7 Using a Micro:bit controller	To understand how variables and inputs can be used on the micro:bit to create a sports counter To create an algorithm for a sport counter, and code, run and evaluate the use of the micro:bit to count activities To create a countdown timer on the micro:bit using variables To evaluate the effectiveness of the LED display on the micro:bit when used as a timer To modify a program using true and false statements and an if…else command Compare different inputs on the micro:bit Define iteration Modify a program with count-controlled iteration Create a program on Micro:bit that gathers the strength of a basketball throw.

SEND

We teach Computing to all children, whatever their ability. Computing forms part of the school's curriculum policy to provide a broad and balanced education to all children. We provide learning opportunities matched to the needs of children with learning difficulties and we consider each child's abilities. SEND children are able to access.

How can I support learners who struggle to access lessons because of learning difficulties?

• Provide visual aids to enable learners to gain an understanding of a range of technology. It should inspire pupils' curiosity to know more about how we can use technology.

• Provide a word and/or picture bank for the learner to refer to during guided and independent activities.

• Use strategies such as modelling, demonstrating and imitating to support learners in understanding the step-by-step processes.

How can I support learners who struggle to retain vocabulary?

• Learners will hear and use a range of specific vocabulary including computer, input, output, device, algorithm, programme, instruction.

• Discuss and display any key vocabulary together with its meaning. Practise saying them together.

•Provide visual word banks that are accessible to the learners.

• Ensure that the vocabulary becomes embedded by referring to it regularly during lessons and whilst modelling.

How can I support learners who may become overwhelmed with all the new information?

• Spend time with these children.

• Discuss what they do understand and explain any language, facts or ideas they are finding challenging

How can I support learners who struggle with attention?

• Reflect on the positioning of learners within the classroom to maximise their engagement. Some learners will benefit from working and interacting with selected others. A calm environment will help minimise distractions.

• Consider adapting the lesson to break it into chunks that permit time for paired or group talk and allow tasks to be completed across manageable stages.

• Pre-expose learners to the content of the lesson by sharing with them any resources to be used as well as the content of the lesson. This will support learners to engage in the processes.

• Giving time for learners to look back through their IT books to make connections to what they already know, which in turn can help nurture motivation.

• Allow movement breaks if and when necessary and give learners classroom jobs such as handing out a resource. This will support learners who struggle with self-regulation.

• All learners should routinely clean and tidy away the equipment they have used and time for this needs to be built into lessons, as it is a useful tool for encouraging independence as well as managing transitions.

How can I support learners who need additional time to develop conceptual understanding?

• Provide opportunities for small group learning either before (pre-teach) or during the lesson. This will support learners and allow time to ask questions or explore resources

alongside adult intervention. These opportunities are part of the repetition process needed to maximise capacity to build up conceptual understanding.

• Take time to model and demonstrate each element of a process, allowing learners to develop their understanding through a step-by-step approach. This will benefit all learners as it allows for an active participatory approach.

• Showing outcomes from the previous lesson's work can be a useful memory aid.

• Have visual aids in the form of worked examples that the learners can have to hand when completing independent tasks

Resources

We use Teach Computing as a basis for our computing teaching.

In addition to this, we use Thinkyouknow CEOP Education

materials for the online safety teaching as well as resources from the Cambridgeshire PHSE scheme digital lifestyles units.

Natterhubs https://natterhub.com/curriculum-alignment

Project EvolveProjectEVOLVE - Education for a Connected World Resources