Computing: Progression Mapped by Strand

Raising aspirations

In order for our pupils to 'soar on wings like eagles' (Isiah 40.31) we ensure that our pupils enjoy a broad and balanced curriculum that promotes 'life in all its fullness' (John 10:10), so that they can each reach their potential. As a church school we acknowledge that all of our pupils are significant to God. We therefore value each child's unique personality and aim to develop their character, talents and abilities to the fullest in His name. Our computing curriculum is an intrinsic part of this, unlocking the potential of each child, so that they can flourish.

Computing and the digital sector make a huge contribution to the British economy and offer a wealth of employment possibilities. We believe that it is our duty to ensure pupils have the skills to access these opportunities later in life and have chosen a computing curriculum that provides breadth without compromising on rigour. We teach computing as a discrete subject, but also embed its use in other areas of the curriculum e.g. art & design, so that pupils can apply their learning and explore computing in a variety of contexts. There are many transferable skills that come from learning about computing, such as resilience, creative problem-solving, team-working and increased social connectivity. We feel these skills are essential to our children's overall development and future economic success in the 21st century.

We complement our KS2 curriculum with visits to our partners at the City Learning Centre (CLC), where pupils benefit from expert teaching and up-to-date equipment. Similarly we seek projects & partnerships that involve digital media with local cultural organisations. Recent projects include working with WAC Arts and one of our animations was screened at The National Gallery in 2021.

Reaching Our Potential

The varied nature of the Teach Computing curriculum means that there is something for every pupil to enjoy. Some pupils love programming and enjoy the rigours of computational thinking, whilst others find their potential in creating new digital media.

We use the Teach Computing curriculum, which has been developed by the National Centre for Computing Education (NCCE). This is an ambitious curriculum created by experts using the latest research. It provides opportunities to learn about; computing systems & networks, data & information, programming and the creation of different types of digital media. These components of computing are essential if pupils are to move beyond being mere consumers of software and digital media and become creators themselves.

Classes are taught one computing unit per half-term. The Teach Computing curriculum also has the following advantages:

- It provides clear lesson plans for teachers, so quality should be consistent
- There is progression built in across year groups to ensure that pupils skills are being developed
- The lessons can be used with software/hardware that we already have or is easy to source

- Resources and software from Purplemash can be used to complement the plans and pupils can access these at home
- It provides a good balance between the teaching of computing science, digital literacy and creating different types of media
- It has clear links to other curriculum areas that teachers can exploit, such as mathematics, science and design & technology
- Many of the Teach Computing units also dovetail neatly with our existing Art & Design and Design & Technology curricula providing opportunities for consolidation and practice

Learning new skills in computing is fun, but also challenging. Pupils are taught that errors are a valuable part of the learning process that helps them to identify what works and what doesn't. The feeling of success that pupils experience after solving a problem, that perhaps they would previously have given up on remains with them, and encourages them to be equally resilient in other areas. In fact, understanding computing and computational thinking better equips pupils to tackle mathematical, scientific or engineering based problems.

Learning to live well together

One of our Christian values is Respect and we use this to frame our conversations regarding how to communicate appropriately on the various digital platforms. Using technology safely is also a strong feature in our curriculum. Each year group completes a Computer Systems and Networks unit. This unit has a strong focus on understanding not only what these things are, but also how they have impacted on human behaviour and the way that we receive information and communicate. Pupils are taught to critically evaluate online information and develop their own code of practice for communicating. Our PHSE curriculum also has a strong focus on these areas too, ensuring that we equip our pupils with the knowledge and know-how to protect themselves online and be kind to others. In addition, we hold special assemblies and lessons during Safer Internet Week.

Pupils often work on projects in pairs. Paired work enables pupils to develop the interpersonal skills that are valued by future employers, such as being able to communicate ideas & plans clearly, plus negotiating differences of approach or opinion.

Impact

Formative assessment opportunities are detailed in each lesson plan, including opportunities for children to self-assess against the success criteria. Summative assessment activities are either provided with the lesson plans or recommended. The objectives in our progression map have been loaded into Integris and teachers are expected to assess the children against them either at the end of each unit or end of each term.

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Computing Progression Map 20-21

Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing systems and networks	**By the end of each year, children should be able:**					
	To identify technology	To recognise the uses and features of information technology	To explain how digital devices function	To describe how networks physically connect to other networks	To explain that computers can be connected together to form systems	To identify how to use a search engine
	To identify a computer and its main parts	To identify information technology in the home	To identify input and output devices	To recognise how networked devices make up the internet	To recognise the role of computer systems in our lives	To describe how search engines select results
	To use a mouse in different ways	To identify information technology beyond school	To recognise how digital services can change the way we work	To outline how websites can be shared via the World Wide Web	To recognise how information is transferred over the internet	To explain how search results are ranked
	To use a keyboard to type	To explain how information technology benefits us	To explain how a computer network can be used to share information	To describe how content can be added and accessed on the World Wide Web	To explain how sharing information online lets people in different places work together	To recognise why the order of results is important, and to whom
	To use a keyboard to edit text	To show how to use information technology safely	To explore how digital devices can be connected	To recognise how the content of the World Wide Web is created by people	To contribute to a shared project online	To recognise how we communicate using technology
	To create rules for using technology responsibly	To recognise that choices are made when using information technology	To recognise the physical components of a network	To evaluate the consequences of unreliable content	To evaluate different ways of working together online	To evaluate different methods of online communication

Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Creating Media	**By the end of each year, children should be able:**					
	To describe what different freehand tools do (painting program e.g. 2paint a picture)	To know what devices can be used to take photographs	To explain that animation is a sequence of drawings or photographs	To identify that sound can be digitally recorded	To identify that drawing tools can be used to produce different outcomes	To use a computer to create and manipulate three-dimensional (3D) digital objects
	To use the shape tool and the line tools (painting program e.g. 2paint a picture)	To use a digital device to take a photograph	To relate animated movement with a sequence of images	To use a digital device to record sound	To create a vector drawing by combining shapes	To compare working digitally with 2D and 3D graphics
	To make careful choices when painting a digital picture	To describe what makes a good photograph	To plan an animation	To explain that a digital recording is stored as a file	To use tools to achieve a desired effect	To construct a digital 3D model of a physical object
	To explain why they chose the painting tools they used	To decide how photographs can be improved	To identify the need to work consistently and carefully	To explain that audio can be changed through editing	To recognise that vector drawings consist of layers	To identify that physical objects can be broken down into a collection of 3D shapes
	To use a computer independently to paint a picture	To use tools to change an image	To review and improve an animation	To show that different types of audio can be combined and played together	To group objects to make them easier to work with	To design a digital model by combining 3D objects
	To compare painting a picture on a computer and on paper	To recognise that images can be changed	To evaluate the impact of adding other media to an animation	To evaluate editing choices made	To evaluate my vector drawing	To develop and improve a digital 3D model
	To use a computer to write	To say how music can make us feel	To recognise how text and images convey information	To explain that digital images can be changed	To recognise video as moving pictures which include audio	To review an existing website and consider its structure

	To add and remove text on a computer	To identify that there are patterns in music	To recognise that text and layout can be edited	To change the composition of an image	To identify digital devices that can record video	To plan the features of a web page
	To identify that the look of text can be changed on a computer	To describe how music is made from a series of notes	To choose appropriate page settings	To describe how images can be changed for different uses	To capture video using a digital device	To consider the ownership and use of images (copyright)
	To make careful choices when changing text	To describe how music can be used in different ways	To add content to a desktop publishing publication	To make good choices when selecting different tools	To recognise the features of an effective video	To recognise the need to preview pages
	To explain why they used the writing tools that they chose	To create music for a purpose	To consider how different layouts can suit different purposes	To recognise that not all images are real	To identify that video can be improved through reshooting and editing	To outline the need for a navigation path
	To compare writing on a computer and writing on paper	To review and refine our computer work	To consider the benefits of desktop publishing	To evaluate how changes can improve an image	To consider the impact of the choices made when making and sharing a video	To recognise the implications of linking to content owned by other people

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Data & Information	**By the end of each year, children should be able:**					
	To label objects	To recognise that we can count and compare objects easily using charts	To create questions with yes/no answers	To explain that data gathered over time can be used to answer questions	To use a form to record information	To identify questions which can be answered using data
	To identify that objects can be counted	To recognise that objects can be represented as pictures	To identify the object attributes needed to collect relevant data	To use a digital device to collect data automatically	To compare paper and computer-based databases	To explain that objects can be described using data
	To describe objects in different ways	To create a pictogram	To create a branching database	To explain that a data logger collects 'data points' from sensors over time	To apply their knowledge of a database to ask and answer real-world questions	To explain that formula can be used to produce calculated data
	To count objects with the same properties	To select objects by attribute and make comparisons	To explain why it is helpful for a database to be well structured	To use data collected over a long duration to find information		To apply formulas to data, including duplicating
	To compare groups of objects	To recognise that people can be described by attributes	To identify objects using a branching database	To identify the data needed to answer questions		To create a spreadsheet to plan an event
	To answer questions about groups of objects	To explain that we can present information using a computer	To compare information shown in a pictogram with a branching database	To use collected data to answer questions	To explain that tools can be used to select data to answer questions	To choose suitable ways to present data

Strand	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Programming	**By the end of each year, children should be able:**						
	Begin to directional language to instruct a child to move along a track	To explain what a given command will do	To describe a series of instructions as a sequence	To explore a new programming environment	To identify that accuracy in programming is important	To control a simple circuit connected to a computer	To define a 'variable' as something that is changeable
	Use verbal instructions as a basis for simple floor robot program	To act out a given word	To explain what happens when we change the order of instructions	To identify that each sprite is controlled by the commands chosen	To create a program in a text-based language	To write a program that includes count-controlled loops	To explain why a variable is used in a program
		To combine forwards and backwards commands to make a sequence	To use logical reasoning to predict the outcome of a program (series of commands)	To explain that a program has a start	To explain what 'repeat' means	To explain that a loop can stop when a condition is met, e.g. number of times	To choose how to improve a game by using variables
		To combine four direction commands to make sequences	To explain that programming projects can have code and artwork	To recognise that a sequence of commands can have an order	To modify a count-controlled loop to produce a given outcome	To conclude that a loop can be used to repeatedly check whether a condition has been met	To design a project that builds on a given example
		To plan a simple program	To design an algorithm	To change the appearance of a project	To decompose a program into parts	To design a physical project which includes selection	To use their own design to create a project
		To find more than one solution to a problem	To create and debug a program that I have written	To create a project from a task description	To create a program that uses count-controlled loops to produce a given outcome	To create a controllable system which includes selection	To evaluate a project that they have made
		To choose a command for a given purpose	To explain that a sequence of commands has a start	To explain how a sprite moves in an existing project	To develop the use of count-controlled loops in a different programming	To explain how selection is used in computer programs	To create a program to run on a controllable device

					environment		
		To show that a series of commands can be joined together	To explain that a sequence of commands has a outcome	To create a program to move a sprite in four directions	To explain that in programming there are infinite loops and count-controlled loops	To relate that conditional statement connects a condition to an outcome	To explain that selection can control the flow of a program
		To identify the effect of changing a value	To create a program using a given design	To adapt to a new context	To develop a design which includes two or more loops which run at the same time	To explain how selection directs the flow of a program	To update a variable with a user input
		To explain that each sprite has its own instructions	To change a given design	To develop a program by adding features	To modify an infinite loop in a given program	To design a program which uses selection	To use a conditional statement to compare a variable to a value
		To design parts of a project	To create a program using my own design	To identify and fix bugs in a program	To design a project that includes repetition	To create a program which uses selection	To design a project that uses inputs and outputs on a controllable device
		To use an algorithm to create a program	To decide how my project can be improved	To design and create a maze based challenge	To create a project that includes repetition	To evaluate my program	To develop a program to use inputs and outputs on a controllable device