**Computing: Progression Mapped by Strand** 

**Intention**

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. This is also in keeping with our status as a UNICEF Rights Respecting School and fulfils our obligations under Article 29 of the United Nations Convention on the Rights of the Child.

**Computer Science**

We believe we must prepare children for life in a digital world and the teaching of computer science is key to this. Our curriculum is designed to teach children the principles of information and computation, so that they know how digital systems work and how to apply this to programming. We aim to develop their computational thinking, so they are better able to conceptualise, understand and use computer-based technology. Children that think in this way are better equipped to problem solve, a skill that can be applied to many areas of the curriculum and more broadly in life.

**Digital literacy**

We aim to teach children how to navigate information and communication technology and use it to express themselves and develop ideas. 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.

**Creativity**

Computing is also a practical subject, in which invention and resourcefulness are encouraged. Our curriculum gives children opportunities to apply their knowledge and skills to creating a variety of purposeful products, from digital paintings to podcasts.

**Implementation**

We follow the curriculum from Teach Computing and each year group studies one computing unit per half-term. We use the Teach Computing curriculum for the following practical reasons:

* It provides clear lesson plans for teachers with obvious progression across year groups
* 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 compliment the plans

However, the most important reason that we adopted this curriculum was that it provided a good balance between the teaching of computing science, digital literacy and creating different types of media. It also 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 Art & Design curriculum, where we have worked hard to include technology. In essence the Teach Computing curriculum supports other areas of learning by providing explicit teaching of computing knowledge and skills that can be applied across the curriculum.

**Computing Progression Map 20-21**

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| **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 |

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| **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 |

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| **Programming** | **By the end of each year, children should be able:** |
| 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 |
| 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 environment | To explain how selection is used in computer programs | To create a program to run on a controllable device |
| 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 |