St Michael & All Angels Computing Progression of Knowledge 2024/2025

|  |
| --- |
| **National Curriculum KS1**Pupils should be taught to:* understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
* create and debug simple programs
* use logical reasoning to predict the behaviour of simple programs
* use technology purposefully to create, organise, store, manipulate and retrieve digital content
* recognise common uses of information technology beyond school
* 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.
 |
| Year 1 | Digital Literacy | Information Technology | Computer Science |
| E-Safety*Linked to Education for a Connected World* | Computer Systems & Networks | Creating Media | Data Handling | *Beebots and ScratchJr* |
| **Copyright and ownership*** I know that the work I create belongs to me.
* I can name my work so that others know it belongs to me.

**Health, well-being and lifestyle*** I can explain rules to keep myself safe when using technology both in and beyond the home.

**Privacy & security*** I can explain how passwords are used to protect information, accounts and devices.
* I can recognise more detailed examples of information that is personal to someone.
* I can explain why it is important to always ask a trusted adult before sharing any personal information online, belonging to myself or others.
 | * Log in and log out means to begin and end a connection with a computer.
* A computer and mouse can be used to click, drag, fill and select and also add backgrounds, text, layers, shapes and clip art.
* Passwords are important for security and to keep us safe.
* To know that technology is something that helps us.
* To identify a computer and know the main parts.
* To know how to type using a keyboard.
* To know you can edit text using a keyboard.
 | * To know some of the simple graphic design features of a piece of online software.
* To make careful choices when painting a digital picture.
* To know how to add and remove text on a computer.
* To know that the look of text can be changed on a computer.
* To know that when we create something on a computer it can be more easily saved and shared than a paper version.
 | * To label objects
* To identify that objects can be counted.
* To know it is important to count objects with the same properties.
* To compare groups of objects.
* To answer questions about groups of objects.
 | * To understand that a program is a set of commands that a computer can run.
* To explain what each button (command) on a Bee-bot does.
* To understand that a series of instructions can be given before they are carried out by the Bee-bot.
* To know that a sprite can be moved in ScratchJr.
* To recognise how to run a command in ScratchJr (press the button)
* To know how to combine commands in a program.
 |

|  |
| --- |
| **National Curriculum KS1**Pupils should be taught to:* understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
* create and debug simple programs
* use logical reasoning to predict the behaviour of simple programs
* use technology purposefully to create, organise, store, manipulate and retrieve digital content
* recognise common uses of information technology beyond school
* 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.
 |
| Year 2 | Digital Literacy | Information Technology | Computer Science |
| E-Safety*Linked to Education for a Connected World* | Computer Systems & Networks | Creating Media | Data Handling | *Bee-bots and ScratchJr* |
| **Copyright and ownership*** I can recognise that content on the internet can belong to other people.
* I can describe why other people’s work belongs to them.

**Health, well-being, and lifestyle*** I can explain simple guidance for using technology in different environments and settings.
* I can say how those rules help anyone accessing online technology.

**Privacy & security*** I can describe and explain some rules for keeping information private.
* I can explain and give examples of what is meant by ‘private’ and ‘keeping things private’.
 | * To recognise different types of computers used in school.
* To identify that a computer is a part of information technology.
* To recognise some features of information technology.
* To explain how information technology helps us.
* To know examples of information technology in school and beyond.
 | * To know that touch typing is the fastest way to type.
* To know that I can make text a different style, size and colour.
* To know that “copy and paste” is a quick way of duplicating text.
* To understand sound can made using a computer.
* To know how to use a computer to create a musical pattern.
* To understand the purpose for creating music.
 | * To recognise that we can count and compare objects using tally charts.
* To recognise that objects can be represented as pictures.
* To create a pictogram.
* To explain that we can present information using a computer.
 | * To understand that a series of instructions are a sequence.
* To know that instructions can be given in different orders and that this changes the outcomes.
* To recognise that you can predict the outcome of a program.
* To know that we call error in a program a ‘bug’ and fixing these 'debugging'.
 |
| **National Curriculum KS2**Pupils should be taught to:* design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
* use sequence, selection, and repetition in programs; work with variables and various forms of input and output
* use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
* use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
* 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, including collecting, analysing, evaluating and presenting data and information
* 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.
* use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.
 |
| Year 3 | Digital Literacy | Information Technology | Computer Science |
| E-Safety*Linked to Education for a Connected World* | Computer Systems & Networks | Creating Media | Data Handling | ***Sequencing*** *in programming* |
| **Copyright and ownership*** I can explain why copying someone else’s work from the internet without permission isn’t fair and can explain what problems this might cause.

**Managing online information*** I can demonstrate how to use key phrases in search engines to gather accurate information online.
 | * To describe what an input is.
* To explain that a process acts on the inputs.
* To explain that an output is produced by the process.
* To understand that changing the process can affect the output.
* To recognise computers can be connected to each other.
* To recognise that a network is made up of a number of components.
 | * To know that animation is a sequence of drawings or photographs in a sequence.
* To know that the capturing device needs to be in a fixed position.
* To know that small changes in the frames will create a smoother animation.
* To understand what onion skinning is.
* Explain the difference between text and images.
* Consider how different layouts can suit different purposes.
* Identify the uses of desktop publishing in the real world.
* Understand why desktop publishing might be helpful
 | * To know that a branching database is a collection of data organised in a tree structure using yes/no or true/false questions. (binary tree)
* To explain that a branching database is an identification tool.
* To understand that a data set can be structured using yes/no questions.
* To explain that a well-structured branching database will enable you to identify objects using fewer questions.
* To identify some real-world applications for branching databases.
 | * To explore a new programming environment (Scratch)
* To know that commands have an outcome.
* To explain that a program has a start.
* To recognise that a **sequence** of commands can have an order.
* To know that commands in Scratch are represented as blocks.
* To explain how a sprite moves in an existing project.
* To build a **sequence** of commands.
* To identify and fix bugs in a program.
 |

|  |
| --- |
| **National Curriculum KS2**Pupils should be taught to:* design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
* use sequence, selection, and repetition in programs; work with variables and various forms of input and output
* use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
* use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
* 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, including collecting, analysing, evaluating and presenting data and information
* 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
* use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.
 |
| Year 4 | Digital Literacy | Information Technology | Computer Science |
| E-Safety*Linked to Education for a Connected World* | Computer Systems & Networks | Creating Media | Data Handling | *Repetition using Logo and Crumble kits.* |
| **Copyright and ownership*** For content to use, I can explain why I need to consider who owns it and whether I have the right to reuse it.
* I can give some examples of content which I must not use without permission from the owner, e.g. videos, music, images.

**Managing Online Information*** I can analyse information to make a judgement about probable accuracy, and I understand why it is important to make my own decisions regarding content and that my decisions are respected by others.
* I can explain what is meant by fake news, e.g. why some people will create stories or alter photographs and put them online to pretend something is true when it isn’t.
 | * To know that the World Wide Web is part of the internet.
* To understand that the internet is the global interconnection of networks.
* Know we need security on the internet.
* To know the World Wide Web is made up of websites and web pages.
* To know that the content of the World Wide Web is created, owned, and shared by people.
* To understand that there is both reliable and unreliable content on the World Wide Web
 | * To identify the input and output devices used to record and play sound.
* To explain that audio recordings can be edited.
* Understand you can combine audio to enhance my podcast project.
* To understand that the composition of digital images can be changed.
* To know that colours can be changed in digital images.
* To know how cloning can be used in photo editing.
* To know how to combine images for a purpose.
 | * Know that computers can use special input devices called sensors to monitor the environment.
* To explain that data gathered over time can be used to answer questions.
* Use a digital device to collect data automatically.
* Explain that a data logger collects ‘data points’ from sensors over time.
* Recognise how a computer can help us analyse data.
* Use a data logger to collect data.
* Interpret data that has been collected using a data logger
 | * To identify that accuracy in programming is important.
* To know how to create a program in a text-based language (Logo).
* Explain what ‘repeat’ or **‘repetition’** means in programming.
* To know that we can use a loop command in a program to repeat instructions.
* To explain that in programming there are indefinite loops and count-controlled loops.
* To know that an indefinite loop will run until the program is stopped.
* To know that you can program a loop to stop after a specific number of times (count-controlled).
* To know when to use a loop and when not to.
 |

|  |
| --- |
| **National Curriculum KS2**Pupils should be taught to:* design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
* use sequence, selection, and repetition in programs; work with variables and various forms of input and output
* use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
* use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
* 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, including collecting, analysing, evaluating and presenting data and information
* 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
* use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.
 |
| Year 5 | Digital Literacy | Information Technology | Computer Science |
| E-Safety*Linked to Education for a Connected World* | Computer Systems & Networks | Creating Media | Data Handling | *Selection in physical computing.**Selection in quizzes.*  |
| **Copyright and ownership*** I can assess and justify when it is acceptable to use the work of others.
* I can give examples of content that is permitted to be reused and know how this content can be found online.
 | * To explain that computers can be connected together to form IT systems.
* To know some examples of data that can be transferred between IT systems.
* To recognise that search engines are examples of large IT systems.
* To know the role of web crawlers in creating an index.
* To explain that ranking orders search results to make them more useful.
* To explain how search engines make money by selling advertising space.
* To know some of the limitations of search engines.
 | * To know that a video is a visual media format.
* To know some features, make videos more effective.
* To know how to use a digital device to record a video.
* To know that you can capture video with a range of techniques.
* To know how to improve a video by reshooting and editing.
* To know that my choices, when making a video, will impact the quality of the final outcome.
* To know a vector drawing is made of lines and shapes.
* To know that each individual element is called an object.
* To explain how alignment grids and resize handles can be used to improve consistency.
* To understand that each added object creates a new layer in the drawing.
 | * To know that flat-file database is a collection of data organised in a single table.
* To know that the term ‘database’ means ‘a collection of organised data that is stored on a computer’.
* To know that a **field** is one specific piece of data in a database record.
* To know that a **record** is a set of data on a particular object. A record is formed from one or more ‘fields’ of data.
* To know how to compare data in databases.
 | * To know how to control a simple circuit connected to a computer.
* To know how to write a program that includes count-controlled loops.
* To know conditions are statements that need to be met for a set of actions to be carried out.
* To explain that a loop can stop when a condition is met.
* To explain that a loop can be used to repeatedly check whether a condition has been met.
* To know that **selection** in programming are points where a decision must be made when designing a program.
 |
|  |  |  |  |  |  |
| **National Curriculum KS2**Pupils should be taught to:* design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
* use sequence, selection, and repetition in programs; work with variables and various forms of input and output
* use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
* use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
* 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, including collecting, analysing, evaluating and presenting data and information
* 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
* use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.
 |
| Year 6 | Digital Literacy | Information Technology | Computer Science |
| E-Safety*Linked to Education for a Connected World* | Computer Systems & Networks | Creating Media | Data Handling | *Variables- unit linked to Design Technology.**Variables- sensing movement Micro:bit.* |
| **Copyright and ownership*** I can demonstrate the use of search tools to find and access online content which can be reused by others.
* I can demonstrate how to make references to and acknowledge sources I have used from the internet.

**Privacy and Security*** I can describe simple ways to increase privacy on apps and services that provide privacy settings.
 | * To understand that data is transferred across networks using agreed protocols. (methods)
* To know that connections between computers allow access to shared stored files.
* To know that data is transferred in packets.
* To understand that computer connected to the internet allow people in different places to work together.
* To understand that communicating and collaborating on the internet can be public or private.
 | * To recognise that you can work in three dimensions on a computer.
* To identify that digital 3D objects can be modified by resizing, recolouring and lifting/lowering.
* To recognise that objects can be combined in a 3D model by rotating, duplicating and grouping.
* To know that placeholders can create holes in 3D objects.
* To know that different types of media are used on websites.
* To know that websites are written in HTML.
* To recognise the common features of a web page.
* To consider the ownership and use of images (copyright)
* To understand the need to preview pages.
* To know that navigation paths are the way that pages are linked together.
* To be aware of the implications of linking to content owned by other people
 | * To know how to create a data set in a spreadsheet.
* To explain what an item of data is.
* To know that a cell is a box on a spreadsheet.
* To explain that formulas can be used to produce calculated data.
* To create a formula which includes a range of cells.
* To understand why data should be organised.
 | * To know that a ‘**variable**’ is something that is changeable.
* To know that a variable has a name and a value.
* To recognise that the value of a variable can be changed.
* To explain that selection can control the flow of a program.
* To identify examples of conditions in the real world.
* To use a condition to change a variable.
* To explain that checking a variable doesn’t change its value.
* To use an operand (e.g. <>=) in an if, then statement.
* To explain the importance of the order of conditions in else, if statements.
* To use a range of approaches to find and fix bugs.
 |