

Core Computing Knowledge Overview

Below is an overview of all of the core computing skills gained during Key Stage One and Two as St Thomas'.
Online Safety runs alongside each unit and is taught within computing sessions and during PSHE throughout all year groups.

Year Group	Core Knowledge (Learning objectives from each lesson)	Assessment Outcome
Nursery	Programming – Cause and effect with toys, e.g. wind up. Turning things on and off. To know that I can manipulate toys to make them work To know what the power symbol is a circle with a line through the top	To operate simple toys To know how to turn a device on
	Computing systems and networks – Role play with laptops, desktops, cameras, phones, tablets To know various types of technology in everyday life and recognise that laptops, desktops and ipads are computers	To use computers appropriately in their symbolic play (identifying the uses of computers)
	Creating Media – Forming shapes digitally (Paintz) To know I can use my finger to digitally draw the outline of a shape on a digital device	To digitally draw 2d shapes
Reception	Computer Systems and networks – What is a computer? - To understand what a computer is and name different parts. - To be able to identify use of technology in the wide world. (remotes, washing machines etc.) - To begin to use a computer mouse or trackpad. - To learn how to switch on and shutdown a computer. - To launch an application and manipulate windows. - To begin to type using a keyboard.	To be able to explain what a computer is and how they are used.

Year One	Creating Media – Digital painting (self portrait)- edited from Y1 - To use the pen tool to draw freehand digitally - To change the colours of the pen - To make my own choices when painting a digital picture, e.g. pen colour - To know painting a picture on a computer is different to painting on paper	To select appropriate colours when producing a self-portrait using a digital pen.
	Programming – Moving a robot: - To know a command means to give an instruction - To follow a simple instruction (command) - To use a forward and backwards command - To plan a simple program - To find a solution to a simple problem	I can programme what a robot does and start predicting the outcome.
	Computer Systems and networks – Technology around us. - To identify technology - To identify a computer and its main parts - To use a mouse in different ways - To use the keyboard to add text - To create rules for using technology responsibly	I can type, save and open a piece of writing on Word.
	Creating Media – Digital painting: - To describe what different freehand tools do - To use the shape tool and the line tools - To make careful choices when painting a digital picture - To explain why I chose the tools I used - To use a computer on my own to paint a picture - To compare painting a picture on a computer and on paper	I can explain my choices when re-creating a piece of artwork using digital tools.
	Programming – Moving a robot: - To explain what a given command will do - To act out a given word - To combine forwards and backwards commands to make a sequence - To combine four direction commands to make sequences - To plan a simple program - To find more than one solution to a problem	I can accurately plan a programme for a robot as a solution to a problem.
	Data and information - Grouping data: - To label objects - To identify that objects can be counted - To describe objects in different ways - To count objects with the same properties	I can sort objects into different groups to answer questions about data.

	- To compare groups of objects - To answer questions about groups of objects	
	Creating media – Digital writing: - To use a computer to write - To add and remove text on a computer - To identify that the look of text can be changed on a computer - To make careful choices when changing text - To explain why I used the tools that I chose - To compare writing on a computer with writing on paper	I can make effective choices to edit text within Word for a purpose.
	Programming – Programming animations: - To choose a command for a given purpose - To show that a series of commands can be joined together - To identify the effect of changing a value - To explain that each sprite has its own instructions - To design the parts of a project - To use my algorithm to create a program	I can use programming blocks to use, modify, and create programs on Scratch Jr.
Year Two	Computer systems and networks- IT around us: - To recognise the uses and features of information technology - To identify information technology in the home - To identify information technology beyond school - To explain how information technology benefits us - To show how to use information technology safely - To recognise that choices are made when using information technology	I understand how IT improves our world and how to use it responsibly.
	Creating Media - Digital photography: - To know what devices can be used to take photographs - To use a digital device to take a photograph - To describe what makes a good photograph - To decide how photographs can be improved - To use tools to change an image - To recognise that images can be changed	I can take photographs and use tools to edit my images.
	Programming- Robot algorithms To describe a series of instructions as a sequence	I can use logical reasoning to predict the outcome of a programme for Beebots

	- To explain what happens when we change the order of instructions - To use logical reasoning to predict the outcome of a program - To explain that programming projects can have code and artwork - To design an algorithm - To create and debug a program that I have written	
	Data and information – Pictograms: - 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 select objects by attribute and make comparisons - To recognise that people can be described by attributes - To explain that we can present information using a computer	I can present data in the form of pictograms and block diagrams to be able to answer questions.
	Creating media- digital music - To explain differences in musical sounds, including those made my computers - To experiment with sound using a computer, e.g. pitch - To use a computer to create a musical pattern using a sequence of notes - To create music on a computer for a purpose - To review and refine my sequence	To create and review digital music
	Programming – Robot algorithms/Programming quizzes: - To explain that a sequence of commands has a start - To explain that a sequence of commands has an outcome - To create a program using a given design - To change a given design - To create a program using my own design - To decide how my project can be improved	I can design algorithms and then test those algorithms as programs and debug them.
Year Three	Computer systems and networks – Computing systems: - Explain how a computer network can be used to share information - Explore how digital devices can be connected - Recognise the physical components of a network - Explain how digital devices function - Identify input and output devices	I can explore inputs, processes, and outputs of digital and non-digital devices. I can begin to explain the role of network infrastructure devices like routers and switches.

	Creating Media – Animation: • Understand animation is a sequence of drawings or photographs • Relate animated movement with a sequence of images • Plan an animation • Review and improve an animation • Evaluate the impact of adding other media to an animation	I can create a story-based animation.
	Programming – Sequencing sounds • To explore a new programming environment • To identify 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 change the appearance of my project • To create a project from a task description	I can make a representation of a piano using Scratch.
	Data and Information – Branching Databases: • To create questions with yes/no answers • To identify the object attributes needed to collect relevant data • To create a branching database • To explain why it is helpful for a database to be well structured • To identify objects using a branching database • To compare the information shown in a pictogram with a branching database	I can create physical and on-screen branching databases, evaluating their effectiveness.
	Creating media- Desktop publishing • To recognise how text and images convey information • To recognise that text and layout can be edited, e.g. font style, size, and colours • To choose appropriate page settings, e.g. placeholders and orientation • To make careful choices when adding content to a desktop publishing publication • To consider how different layouts can suit different purposes • To consider the benefits of desktop publishing	To make careful choices within desktop publishing to create an effective magazine cover
	Programming- events and actions in programs • To explain how a sprite moves in an existing project • To create a program to move a sprite in four directions to navigate a maze • To adapt a program to a new context • To develop my program by adding features and test their effectiveness • To identify and fix bugs in a program	To design, and code my own maze tracing program.

	To design, implement and evaluate a project in scratch	
Year Four	Computer systems and networks – The Internet: - Describe how networks physically connect to other networks - Recognise how networked devices make up the internet - Describe how content can be added and accessed on the World Wide Web - Recognise how the content of the WWW is created and shared by people - Describe the current limitations of World Wide Web media	I know the World Wide Web is part of the internet, and can evaluate the reliability of online content.
	Creating Media – Audio production: - Press/tap buttons to start and stop recordings - Recognise recorded audio is stored as a file - Edit and alter recorded audio - Layer sounds - Save/export an audio file - Consider the results of editing choices made	I can use Audacity to create and edit a podcast.
	Programming – Repetition in Shapes: - To identify that accuracy in programming is important - To create a program in a text-based language - To explain what 'repeat' means - To modify a count-controlled loop to produce a given outcome - To decompose a program into parts - To create a program that uses count-controlled loops to produce a given outcome	I can plan, modify and test commands to create shapes and patterns using Logo.
	Data and information- Data logging - To explain that data gathered over time can be used to answer questions - To explain that data from sensors can be recorded and used to answer questions - To explain that a data logger collects 'data points' from sensors over time - To recognise how a computer can help us analyse data, e.g. sorting - To plan how to collect data using a data logger to answer a question - I can interpret data that has been collected using a data logger and draw conclusions	I can use data loggers to automatically collect the data needed to answer questions.
	Creating Media – Photo editing: - To explain that digital images can be changed - To change the composition of an image - To describe how images can be changed for different uses - To make good choices when selecting different tools	I can edit images and evaluate the effectiveness of my choices

	- To recognise that not all images are real - To evaluate how changes can improve an image	
	Programming – Repetition in games - 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	I can to design and create a game which uses repetition using Scratch.
Year Five	Computer Systems and networks – Sharing Information: - Explain that computers can be connected together to form systems - Recognise the role of computer systems in our lives - Recognise how information is transferred over the internet - Explain how sharing information online lets people in different places work together - Contribute to a shared project online - Evaluate different ways of working together online	I can understand computer systems and how information is transferred between systems and devices. I can explain the input, output, and process aspects of a variety of different real-world systems.
	Creating Media – Video production: - To recognise video as moving pictures, which can include audio - To identify digital devices that can record video - To capture video using a digital device - To recognise the features of an effective video - To identify that video can be improved through reshooting and editing - To consider the impact of the choices made when making and sharing a video	I can plan, create and evaluate my own video.
	Programming- selection in physical computing - To create a simple circuit and connect it to a microcontroller - To write a program that includes count-controlled loops - 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 design a physical project that includes selection - To create, test and debug a program that controls a physical computing project	I can connect and program components using a microcontroller (Crumble controller)
	Data and information - Flat-file databases: - To use a form to record information - To compare paper and computer-based databases	I can use a database to answer questions and present using charts/graphs.

	- To outline how grouping and then sorting data allows us to answer questions - To explain that tools can be used to select specific data - To explain that computer programs can be used to compare data visually - To apply my knowledge of a database to ask and answer real-world questions	
	Creating media- Introduction to vector graphics - To recognise that vector drawings are made using shapes - To move, resize, and rotate objects and duplicate to create a vector drawing - To use tools to achieve a desired effect and improve consistency - To use layering to create an image, and understand how to change the order of layers in a vector drawing - To duplicate and group objects to make them easier and more efficient to work with - I can reflect on the skills I have used and why I have used them within a vector drawing and explain how this compares to a freehand drawing	I can layer objects and use a range of tools to produce a complex piece of work
	Programming- quizzing - To identify and modify conditions in a program - To identify the condition and outcomes in an 'if... then... else...' statement - To explain how selection directs the flow of a program - To design a program which uses selection - To implement, test and share my programme with others - To evaluate ways I can improve my program further	I can use my knowledge of writing programs and using selection to control outcomes to design a quiz
Year Six	Computer Systems and networks - Communication: - To identify how to use a search engine - To describe how search engines, select results - To explain how search results are ranked - To recognise why the order of results is important, and to whom - To recognise how we communicate using technology - Evaluate different ways of online communication	I can evaluate which methods of internet communication to use for particular purposes.
	Creating Media – Webpage creation: - To review an existing website and consider its structure - To plan the features of a web page - To consider the ownership and use of images (copyright) - To recognise the need to preview pages - To outline the need for a navigation path	I can identify what makes a good web page and use this information to design and evaluate my own website.

	To recognise the implications of linking to content owned by other people	
	Programming - Variables in Games: - To define a 'variable' as something that is changeable - To explain why a variable is used in a program - To choose how to improve a game by using variables - To design a project that builds on a given example - To use my design to create a project - To evaluate my project	I can create a game with a simulation scoreboard using Scratch.
	Data and information – Spreadsheets: - To identify questions which can be answered using data - To explain that objects can be described using data - To explain that formulas can be used to produce calculated data - To apply formulas to data, including duplicating - To create a spreadsheet to plan an event To choose suitable ways to present data	I can use a spreadsheet to plan an event and answer questions.
	Creating media – 3D Modelling - To recognise that you can work in three dimensions on a computer - To lift/lower, recolour and resize a digital 3D object - To rotate, duplicate and group digital 3D objects - To show that placeholders can create holes in 3D objects - To plan my own 3D model for a given purpose - To self and peer evaluate a design and make modifications to improve it	I can plan, develop, and evaluate my own 3D model of a building
	Programming B - Sensing movement - To create a program to run on a controllable device - To explain that selection can control the flow of a program - To update a variable with a user input - To use a conditional statement to compare a variable to a value using an operand (e.g. < > =>) - To design a project that uses inputs and outputs on a controllable device - I can use a range of approaches to find and fix bugs within my programme	I can use my knowledge of the programming constructs to design and create my own micro:bit based step counter.