Seaton St Paul's C of E Junior School

Knowledge and Skills Progression

National Curriculum Objectives at KS2	Knowledge and Skills (all referenced in Teach Computing Learning Graphs)			
	Year 3	Year 4	Year 5	Year 6
Computer Science Strand of Computing (Coding, Algorithms, Programming and understanding Computer Networks)				
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**	• Explain what an input and sequence is • Identify that a program includes a sequence of commands • Explain that the order of commands can affect a programs output • To build a sequence of commands • To combine and order commands in a program • To create a sequence of commands to produce a given outcome	• Explain what repeat means • Identify a loop in a program • Identify patterns in sequences including loop commands • Explain that in programming there are both infinite and time-controlled loops • Identify data that can be logged over time • To list an everyday task as a set of instructions including repetition • To use an infinite or count controlled loop to produce a written outcome • To recognise tools that enable more than one process to run at the same time • To create two or more sequences that run concurrently • To use a digital device to collect data, sort by attributes and export it in different formats	• Explain that a condition can only be true or false • Relate that a count-controlled loop has a condition • Compare both count and condition-controlled loops • Explain the importance of instructional order in 'if… then… else' statements • To create a condition-controlled loop • To use a conditional statement 'if…then ...so' to start and action • To use selection to switch the program flow in one or two ways • To use conditional statements to produce given outcomes	• Define a variable as something that is changeable • Identify examples of information that are variable • Explain that a variable has a name and value • Explain the importance of setting up variables at the start of a program • To identify a variable in an existing program • To experiment with the value of the existing variable • To name the role of the variable • To decide where in a program to set a variable • To use variables as conditional statements to control the flow of a program

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	• Explain that a process acts on the input before producing an output • Recognise digital devices are made of many parts and they can connect to each other • Identify how devices in a network are connected to one another • Identify the benefits of computer networks • To identify input and output devices • To explain that a Computer system accepts input and processes it to produce an output • To explain how computer networks can be used to share information • To explain the role of a switch server and wireless access in a network • To explain how networks can be connected to other networks	• Describe how networks connect to other networks • Outline how information can be shared by the World Wide Web • Explain that the global interconnection of networks is the internet • Describe how to access the World Wide Web and the types of content/media that can be added, created and shared. • Explain how the content is created, owned and shared by people • Explain that the internet enables us to view the World Wide Web and the websites and webpages it is made of • Evaluate the reliability of content and the consequences of unreliable content • Explain the benefits and limitations of the World Wide Web	• Recognise that a system is a series of interconnected parts which work together • Explain that Computers can be connected together to form IT systems • Recognise the inputs, processes and outputs of large IT systems • Explain the role of WebCrawler's • To describe the input and output of a search engine • To demonstrate how different search terms, produce differing results • To evaluate the results of search terms	• Recognise that data is transferred across networks using protocols • Explain that data is transferred in packets • Recognise computers connected to the internet allow people to work together • Explain which types of media can be shared through the internet. • To outline methods of communicating and collaborating using the internet • To choose and evaluate methods of internet communication and collaboration for given purposes • To decide what you should and shouldn't share online
Information Technology Strand of Computing (Word Processing, Presentations, Data Handling)				
Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	• Recognise how images and text can be used together to convey information • Consider how different layouts and fonts can suit different purposes • Recognise that DTP pages can be structured with placeholders • Consider the benefits of using a DTP application	• Use an application to change the whole of the digital image or part of it • Change the composition of an image by cropping, rotating, adjusting the colour pre-sets, filtering and adding digital affects to it. • Use an application to add a composition of a digital image	• Explain that a Computer program can organise data • Outline how 'AND' and 'OR' can be used to refine data selection • Outline how data can be filtered • Explain that computer programs can be used to compare data visually • Explain that we present information to communicate a message	• Recognise the relationship between HTML and visual display • Understand that webpages are written by people and the copyright implications of using images/text • Recognise that web pages contain different media and hyperlinks • Understand the need for navigation paths and preview pages.

	• To show that page orientation can be changed • To organise, move and edit text and image placeholders in a page layout • To review a document	• To recognise that digital images can be manipulated • To identify that digital images can be changed for different purposes • To choose the most appropriate tool for a purpose • To consider the impact of changes made on the quality of the image	• To choose different ways to view data • To ask questions that need more than one answer • To choose which attribute and value to search by • To choose multiple criteria to search data to answer questions (AND/OR) • To choose suitable ways to present information to other people	• To review an existing website • To create a new blank webpage • To add text, embed media, insert hyperlinks and preview a webpage
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 **(this coverage is addressed in all topics of the Teach Computing Curriculum)**				
Digital Literacy Strand of Computing (Using Technology Safely and Analysing Digital Content)				
Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	• Explain that an animation is made up of a sequence of images • Identify that a capturing device needs to be in a fixed position • Recognise that smaller movements create smoother operations • Explain the need for consistent working • Explain the impact of adding other media to an animation • Understand that a project must be exported to be shared • To plan an animation using a storyboard • To capture an image • To use the onion skinning tool to review the subject's position • To review a captured sequence of frames as an animation	• Identify that sound can be recorded • Identify that both an input and output device are needed to record and play sound • Recognise that recorded audio can be stored on a computer and edited • Link to Science and recognise sound can be represented as a waveform • Consider the results of editing choices made • To record sound using a computer • To play and import audio into a project • To delete a section of audio • To change the volume of tracks in a project	• Explain features of video as a visual media format • Recognise which devices can and can't record video • Explain the purpose of a storyboard • Recognise that filming techniques can be used to create different effects • Explain limitations of editing a video on the recording device • Recognise projects need to be exported to be shared • To identify features of a video recording device or application • To combine filming techniques for a given purpose e.g. angles • To decide what changes to make when editing	• Explain that 3D models can be created on a computer • Recognise that a 3D environment can be viewed from different perspectives • Recognise that digital tools can be used to manipulate 3D objects • Show how placeholders can create holes in 3D objects • Recognise that artefacts can be broken down into a collection of 3D objects • To position 3D shapes relative to one another • To use digital tools to modify 3D objects • To combine objects to create a 3D digital artefact • To use digital tools to accurately size 3D objects

	• To add media to enhance the animation • To review a completed project		• To choose to reshoot, or improve scenes later through editing • To use split, trim and crop to edit a video	• To construct a 3D model which reflects a real-world object