

Edward Peake CofE Middle School
Computing Curriculum Progression

Curriculum Intent:

The intention of our curriculum is to provide a broad, balanced and knowledge rich education which ensures every child is offered challenging and engaging learning experiences with Christian values at their heart. Our computing curriculum has been specially designed to meet the needs of our pupils, many of whom have had limited experiences in using technology for a wide range of purposes. We benefit from two well equipped computing labs as well as additional resources to compliment our curriculum. This allows pupils to use different types of computers across the curriculum and other resources such as BBC micro-bits within their computing lessons.

Our main aims are to:

- **Live:** Ensure pupils develop skills and personal qualities which allow them to make an active contribution to the world around them in order to be prepared for jobs for the future.
- **Love:** Broaden pupils' horizons by giving them opportunities to explore the connected world and the impact a connected world has on them and others
- **Learn:** Develop independent, confident and successful learners who are able to solve problems with resilience and able to learn from their mistakes

The key concepts threaded through the computing curriculum are **education for a connected world**, **problem solving** and **jobs for the future**.

These concepts ensure that pupils not only access the required curriculum but also think more deeply in order to consider the implications of choices they make. Pupils are challenged to justify their choices and evaluate the actions they have taken and their impact.

Skills and Knowledge	Year 5	Year 6	Year 7	Year 8
<p>Computer systems What is a computer, how do its constituent parts function together as a whole?</p> <p>Education for a connected world Problem solving</p>	<p>Pupils know:</p> <ul style="list-style-type: none"> • that a computer system features inputs, processes, and outputs. • that computer systems communicate with other devices, that systems are built using a number of parts as well as the benefits of a given computer system 	<p>Pupils know:</p> <ul style="list-style-type: none"> • how to apply knowledge of programming to a new environment • how to test program on an emulator • how to transfer program to a controllable device • how to determine the flow of a program using selection 	<p>Pupils know:</p> <ul style="list-style-type: none"> • examples of the hardware necessary for connecting devices to networks • similarities and differences of wired to wireless connections and list examples of specific technologies currently used to implement such connections 	<p>Pupils know:</p> <ul style="list-style-type: none"> • that a general-purpose computing system is a device for executing programs • the difference between a general-purpose computing system and a purpose-built device • the function of the hardware components used in computing systems

	<ul style="list-style-type: none"> • tasks that are managed by computer systems • the human elements of a computer system • how to experiment with different camera angles • how to identify and find features on a digital video recording device • how to use a microphone, how to create a simple circuit and connect it to a microcontroller as well as what an infinite loop does. • how to program a microcontroller to make an LED switch on • how to connect more than one output component to a microcontroller • how to design sequences that use count-controlled loops, • how to use a count-controlled loop to control outputs, • how to design a conditional loop, • a condition is either true or false, • how to program a microcontroller to respond to an input, • how to write an algorithm that describes what a model will do 	<ul style="list-style-type: none"> • how to identify examples of conditions in the real world • variable in an if, then, else statement to select the flow of a program • different physical inputs • that if you read a variable, the value remains a condition to change a variable • the importance of the order of conditions in else, if statements • how to modify a program to achieve a different outcome use an operand (e.g. <=>) in an if, then statement • what variables to include in a project • how to design an algorithm for a project • how to design the program flow for a project • a range of approaches to find and fix bugs 		<ul style="list-style-type: none"> • how the hardware components used in computing systems work together in order to execute programs • that all computing systems, regardless of form, have a similar structure ('architecture') • how the hardware components used in computing systems work together in order to execute programs • what an operating system is, and recall its role in controlling program execution • the NOT, AND, and OR logical operators, and how they are used to form logical expressions • how to use logic gates to construct logic circuits, and associate these with logical operators and expressions • how hardware is built out of increasingly complex logic circuits • that, since hardware is built out of logic circuits, data and instructions alike need to be represented using binary digits
--	---	--	--	--

				<ul style="list-style-type: none"> • broad definitions of 'artificial intelligence' and 'machine learning' • examples of artificial intelligence and machine learning in the real world • the steps involved in training machines to perform tasks (gathering data, training, testing) • how machine learning differs from traditional programming • the use of artificial intelligence with moral dilemmas • what a search engine is • how search engines 'crawl' through the World Wide Web and how they select and rank results • that a program written in a programming language needs to be translated in order to be executed by a machine • examples of how symbols are carried on physical media
Where this is taught:	Year 5- Autumn 1 Computing systems and network- Sharing information	Year 6- Autumn 1 Computer systems and networks- Communication	Year 7- Spring 2 Networks from semaphore to internet	Year 8- Autumn1 Computing systems
Networks	Pupils know:	Pupils know:	Pupils know:	Pupils know: <ul style="list-style-type: none"> • what a search engine is

<p>Understand how networks can be used to retrieve and share information and come with associated risks</p> <p>Education for a connected world</p> <p>Problem solving</p>	<ul style="list-style-type: none"> • that data is transferred over networks in packets • that networked digital devices have unique addresses • that data is transferred using agreed methods • that the internet allows different media to be shared • that connected digital devices can allow us to access shared files stored online • Information can be sent over the internet in different ways • how to compare working online with working offline • how the internet enables effective collaboration • different ways of working together online • that working together on the internet can be public or private 	<ul style="list-style-type: none"> • how to compare results from different search engines • how to complete a web search to find specific information • how to refine my search • why we need tools to find things online • the role of web crawlers in creating an index • how to relate a search term to the search engine's index • that a search engine follows rules to rank relevant pages • that search results are ordered • some of the criteria that a search engine checks to decide on the order of results • some of the ways that search results can be influenced • how search engines make money • some of the limitations of search engines • methods of communication to suit particular purposes • the different ways in which people communicate • that there are a variety of ways of 	<ul style="list-style-type: none"> • what a computer network is and explain how data is transmitted between computers across networks • 'protocol' and provide examples of non-networking protocols • examples of the hardware necessary for connecting devices to networks • differences between wired to wireless connections and list examples of specific technologies currently used to implement such connections • bandwidth', using the appropriate units for measuring the rate at which data is transmitted, and discuss familiar examples where bandwidth is important • what the internet is • key words such as 'protocols', 'packets', and 'addressing' • the difference between the internet, its services, and the World Wide Web • how services are provided over the internet, listing some of these services and the 	<ul style="list-style-type: none"> • how search engines 'crawl' through the World Wide Web and how they select and rank results • how search engines select and rank results when searches are made • how to use search technologies effectively • the impact of search technologies and the issues that arise by the way they function and the way they are used • how data travels between computers across the internet
---	---	---	--	---

		<p>communicating over the internet</p> <ul style="list-style-type: none"> • different methods of communicating on the internet • when things should and should not be shared • that communication on the internet may not be private • the different types of media used on websites • how to explore a website • that websites are written in HTML • why navigation paths are useful • what a navigation path is • how to multiple web pages and link them using hyperlinks • how to create hyperlinks to link to other people's work • how to evaluate the user experience of a website • the implication of linking to content owned by others 	<p>context in which they are used</p> <ul style="list-style-type: none"> • the term 'connectivity' as the capacity for connected devices ('Internet of Things') to collect and share information about me with or without my knowledge (including microphones, cameras, and geolocation) • how internet-connected devices can affect me • components (servers, browsers, pages, HTTP and HTTPS protocols, etc.) and how they work together 	
Where this is taught:	Year 5- Autumn 1 Computing systems and network- Sharing information	Year 6- Autumn 1 Computer systems and networks- Communication Autumn 2- Creating Media- Web page creation	Year 7- Spring 2 Networks from semaphore to internet	Year 8- Spring 1 Developing for the web

<p>Programming Creating software to allow computers to solve problems</p> <p>Education for a connected world</p> <p>Problem solving</p> <p>Jobs for the future</p>	<p>Pupils know:</p> <ul style="list-style-type: none"> • how to create a simple circuit and connect it to a microcontroller • what an infinite loop does • how to program a microcontroller to make an LED switch on • how to connect more than one output component to a microcontroller • sequences that use count-controlled loops • how to use a count-controlled loop to control outputs • how to design a conditional loop • that a condition is either true or • how to program a microcontroller to respond to an input • that a condition being met can start an action • how to use selection (an 'if...then...' statement) to direct the flow of a program • how to create a detailed drawing of my project • how to identify a real-world example of a condition starting an action 	<p>Pupils know:</p> <ul style="list-style-type: none"> • that the way that a variable changes can be defined • examples of information that is variable • that variables can hold numbers or letters • that a variable has a name and a value • a program variable as a placeholder in memory for a single value • that the value of a variable can be changed • where in a program to change a variable • How to make use of an event in a program to set a variable • that the value of a variable can be used by a program • How to create algorithms for a project • How to choose a name that identifies the role of a variable • How to test the code that I have written • How to extend my game further using more variables • ways that my game could be improved • How to share my game with others 	<p>Pupils know:</p> <p>Use basic formulas with cell references to perform calculations in a spreadsheet (+, -, *, /)</p> <ul style="list-style-type: none"> - Use the functions SUM, COUNTA, MAX, and MIN in a spreadsheet - Use the functions AVERAGE, COUNTIF, and IF in a spreadsheet - Use conditional formatting in a spreadsheet - Apply all of the spreadsheet skills covered in this unit - Predict the outcome of a simple sequence - Modify a sequence - Define a variable as a name that refers to data being stored by the computer - Recognise that computers follow the control flow of input/process/output - Predict the outcome of a simple sequence that includes variables - Trace the values of variables within a sequence - Make a sequence that includes a variable - Define a condition as an expression that will be evaluated as either true or - Identify that selection uses conditions to control the flow of a sequence 	<p>Pupils know:</p> <p>Recall that a program is a sequence of instructions that specify operations that are to be performed on data</p> <ul style="list-style-type: none"> - Describe how the hardware components used in computing systems work together in order to execute programs - Recall that, since hardware is built out of logic circuits, data and instructions alike need to be represented using binary digits - Describe how machine learning differs from traditional programming - Explain the implications of sharing program code - Describe what HTML is - Use HTML to structure static web pages - Modify HTML tags using inline styling to improve the appearance of web pages - Display images within a web page - Apply HTML tags to construct a web page structure from a provided design - Describe what CSS is - Use CSS to style static web pages - Assess the benefits of using CSS to style pages instead of in-line formatting
---	--	--	--	--

	<ul style="list-style-type: none"> • how to test and debug my project • how to use selection to produce an intended outcome • how to write an algorithm that describes what my model will do • the outcome of user input in an algorithm • how to implement an algorithm to create the first section of a program • how to share my program with others • how to test a program • How to extend a program further • the setup code needed in a program • ways the program could be improved 	<ul style="list-style-type: none"> • How to construct a formula in a spreadsheet • the relevance of a cell's data type • that changing inputs changes outputs • How to apply a formula to multiple cells by duplicating it • How to create a formula which includes a range of cells • that data can be calculated using different operations • How to apply my knowledge of programming to a new environment • How to test my program on an emulator • How to transfer my program to a controllable device • How to determine the flow of a program using selection • examples of conditions in the real world • How to use a variable in an if, then, else statement to select the flow of a program • How to experiment with different physical inputs • that if you read a variable, the value remains 	<ul style="list-style-type: none"> - Identify where selection statements can be used in a program - Modify a program to include selection - Create conditions that use logic operators (and/or/not) - Identify where selection statements can be used in a program that include comparison and logical operators - Define iteration as a group of instructions that are repeatedly executed - Describe the need for iteration - Identify where count-controlled iteration can be used in a program - Implement count-controlled iteration in a program - Detect and correct errors in a program (debugging) - Independently design and apply programming constructs to solve a problem (subroutine, selection, count-controlled iteration, operators, and variables) - Define a subroutine as a group of instructions that will run when called by the main program or other subroutines - Define decomposition as breaking a problem down 	<ul style="list-style-type: none"> - Create hyperlinks to allow users to navigate between multiple web pages - Describe what algorithms and programs are and how they differ - Recall that a program written in a programming language needs to be translated in order to be executed by a machine - Write simple Python programs that display messages, assign values to variables, and receive keyboard input - Locate and correct common syntax errors - Describe the semantics of assignment statements - Use simple arithmetic expressions in assignment statements to calculate values - Use relational operators to form logical expressions - Use binary selection (if, else statements) to control the flow of program execution - Generate and use random integers - Use multi-branch selection (if, elif, else statements) to control the flow of program execution - Describe how iteration (while statements) controls
--	---	--	--	---

		<ul style="list-style-type: none"> • How to use a condition to change a variable • the importance of the order of conditions in else, if statements • How to modify a program to achieve a different outcome • How to use an operand (e.g. <=>) in an if, then statement • what variables to include in a project • How to design the algorithm for my project • How to design the program flow for my project • How to create a program based on my design • How to test my program against my design • How to use a range of approaches to find and fix bugs 	<p>into smaller, more manageable subproblems</p> <ul style="list-style-type: none"> - Identify how subroutines can be used for decomposition - Identify where condition-controlled iteration can be used in a program - Implement condition-controlled iteration in a program - Evaluate which type of iteration is required in a program - Define a list as a collection of related elements that are referred to by a single name - Describe the need for lists - Identify when lists can be used in a program - Use a list - Decompose a larger problem into smaller subproblems - Apply appropriate constructs to solve a problem - Decompose a larger problem into smaller subproblems - Apply appropriate constructs to solve a problem 	<p>the flow of program execution</p> <ul style="list-style-type: none"> - Use iteration (while loops) to control the flow of program execution - Use variables as counters in iterative programs - Combine iteration and selection to control the flow of program execution - Use Boolean variables as flags - Identify when a problem needs to be broken down - Implement and customise GUI elements to meet the needs of the user - Recognise that events can control the flow of a program - Use user input in an event-driven programming environment - Use variables in an event-driven programming environment - Develop a partially complete application to include additional functionality - Identify and fix common coding errors - Pass the value of a variable into an object - Use user input in a block-based programming language - Use a block-based programming language to create a sequence
--	--	--	---	--

				<ul style="list-style-type: none"> - Use variables in a block-based programming language - Use a block-based programming language to include sequencing and selection - Use user input in a block-based programming language - Use variables in a block-based programming language - Reflect and react to user feedback - Use a block-based programming language to include sequencing and selection - Use user input in a block-based programming language - Use variables in a block-based programming language - Evaluate the success of the programming project
Where this is taught:	Year 5- Spring 1 Selection in physical computing Summer 2- Selection in quizzing	Year 6- Spring 1 Variables in games Spring 2- Data and information- Spreadsheets Summer 2- Programming- Sensing	Year 7- Spring 2 Programming essentials in Scratch Part I Summer 1 Programming essentials in Scratch Part II Summer 2- Modelling data-spreadsheets	Year 8- Autumn 2- Computing systems Spring 1- Developing for the web Summer 1 Mobile app development Summer- Introduction to Python programming
Data and information	Pupils know:	Pupils know:	Pupils know:	Pupils know:

<p>How is data stored, organised and used to represent real world artefacts and scenarios</p>	<ul style="list-style-type: none"> • create multiple questions about the same field • explain how information can be recorded • order, sort, and group my data cards • choose which field to sort data by to answer a given question • explain what a 'field' and a 'record' is in a database • combine grouping and sorting to answer more specific questions • explain how information can be grouped • group information to answer questions • navigate a flat-file database to compare different views of information • choose multiple criteria to answer a given question • choose which field and value are required to answer a given question • outline how 'AND' and 'OR' can be used to refine data selection • explain the benefits of using a computer to create graphs • refine a chart by selecting a particular filter 	<ul style="list-style-type: none"> • answer questions from an existing data set • ask simple relevant questions which can be answered using data • explain the relevance of data headings • apply an appropriate number format to a cell • build a data set in a spreadsheet application • explain what an item of data is • construct a formula in a spreadsheet • the relevance of a cell's data type • that changing inputs changes outputs • apply a formula to multiple cells by duplicating it • create a formula which includes a range of cells • that data can be calculated using different operations • apply a formula to calculate the data I need to answer questions • explain why data should be organised • use a spreadsheet to answer questions • produce a graph • when to use a table or graph 	<ul style="list-style-type: none"> • Identify columns, rows, cells, and cell references in spreadsheet software • basic formulas with cell references to perform calculations in a spreadsheet (+, -, *, /) • the autofill tool to replicate cell data • the difference between data and information • the difference between primary and secondary sources of data • Collect and analyse data • Create appropriate charts in a spreadsheet • Use the functions SUM, COUNTA, MAX, and MIN in a spreadsheet • Use a spreadsheet to sort and filter data • Use the functions AVERAGE, COUNTIF, and IF in a spreadsheet • Use conditional formatting in a spreadsheet • referencing techniques that credit authors appropriately 	<ul style="list-style-type: none"> • Recall that, since hardware is built out of logic circuits, data and instructions alike need to be represented using binary digits • what vector graphics are • examples where using vector graphics would be appropriate • examples of representations • that representations are used to store, communicate, and process information • examples of how different representations are appropriate for different tasks • that characters can be represented as sequences of symbols and list examples of character coding schemes • the length of a representation as the number of symbols that it contains • examples of how symbols are carried on physical media • what binary digits (bits) are, in terms of familiar symbols such as digits or letters
---	--	--	---	---

	<ul style="list-style-type: none"> • select an appropriate chart to visually compare data • questions that will need more than one field to answer • present my findings to a group • refine a search in a real-world context • discuss how a vector drawing is different from paper-based drawings • identify the main drawing tools • recognise that vector drawings are made using shapes 	<ul style="list-style-type: none"> • a graph to show the answer to questions 		<ul style="list-style-type: none"> • the size or length of a sequence of bits as the number of binary digits that it contains • how natural numbers are represented as sequences of binary digits • Convert between different units and multiples of representation size • examples of the different ways that binary digits are physically represented in digital devices
Where this is taught:	Year 5- Spring 2 Data and information- Flat-file databases Summer 1 Creating Media- vector drawings	Year 6- Spring 2 Data and information- Spreadsheets	Year 7- Spring 1- Using Media Summer 2 Modelling data- Spreadsheets	Year 8- Autumn 1 Media- vector graphics Autumn 2- Computer Systems Spring 1- Developing for the web Spring 2- Representation- from clay to silicon
Design and development The activities involved in planning, creating and evaluating computing artefacts	Pupils know: create a detailed drawing of my project - I can describe what my project will do - I can identify a real-world example of a condition starting an action - I can test and debug my project	Pupils know: compare different methods of communicating on the internet - I can decide when I should and should not share - I can explain that communication on the internet may not be private	Pupils know: effective presentations for a given audience - Independently design and apply programming constructs to solve a problem (subroutine, selection, count-controlled iteration, operators, and variables)	Pupils know: HTML tags using inline styling to improve the appearance of web pages - Use CSS to style static web pages - Create hyperlinks to allow users to navigate between multiple web pages

	<ul style="list-style-type: none"> - I can use selection to produce an intended outcome - I can write an algorithm that describes what my model will do - I can choose which field to sort data by to answer a given question - I can explain what a 'field' and a 'record' is in a database - I can navigate a flat-file database to compare different views of information - I can apply what I have learned about vector drawings - I can suggest improvements to a vector drawing - I create alternatives to vector drawings - I can identify the outcome of user input in an algorithm - I can outline a given task - I can use a design format to outline my project - I can implement my algorithm to create the first section of my program - I can share my program with others - I can test my program - I can extend my program further - I can identify the setup code I need in my program 	<ul style="list-style-type: none"> - I can discuss the different types of media used on websites - I can explore a website - I know that websites are written in HTML - I can draw a web page layout that suits my purpose - I can recognise the common features of a web page - I can suggest media to include on my page - I can describe what is meant by the term 'fair use' - I can find copyright-free images - I can say why I should use copyright-free images - I can add content to my own web page - I can evaluate what my web page looks like on different devices and suggest/make edits - I can preview what my web page looks like - I can describe why navigation paths are useful - I can explain what a navigation path is - I can make multiple web pages and link them using hyperlinks - I can create hyperlinks to link to other people's work - I can evaluate the user experience of a website 	<ul style="list-style-type: none"> - Apply appropriate constructs to solve a problem - Evaluate formatting techniques to understand why we format documents - Design the layout of the content to make it suitable for the audience 	<ul style="list-style-type: none"> - Implement navigation to complete a functioning website - Combine multiple tools and techniques to create a vector graphic design - Improve your own project work based on feedback - Implement and customise GUI elements to meet the needs of the user - Develop a partially complete application to include additional functionality - Establish user needs when completing a creative project - Apply decomposition to break down a large problem into more manageable steps - Evaluate the success of the programming project
--	---	--	--	--

	<ul style="list-style-type: none"> - I can identify ways the program could be improved 	<ul style="list-style-type: none"> - I can explain the implication of linking to content owned by others - I can decide where in a program to change a variable - I can make use of an event in a program to set a variable - I can recognise that the value of a variable can be used by a program - I can choose the artwork for my project - I can create algorithms for my project - I can explain my design choices - I can choose a name that identifies the role of a variable - I can create the artwork for my project - I can test the code that I have written - I can extend my game further using more variables - I can identify ways that my game could be improved - I can share my game with others - I can choose which 3D objects I need to construct my model - I can modify multiple 3D objects - I can plan my 3D model - I can decide how my model can be improved 		
--	---	--	--	--

		<ul style="list-style-type: none"> - I can evaluate my model against a given criterion - I can modify my model to improve it - I can decide what variables to include in a project - I can design the algorithm for my project - I can design the program flow for my project - I can create a program based on my design - I can test my program against my design - I can use a range of approaches to find and fix bugs 		
Where this is taught:	Year 5 Autumn Term 2- Creating Media Spring Term 1- Selection in physical computing Summer Term 1- Creating Media Summer Term 2- Selection in quizzing	Year 6 Autumn Term 2- Creating media Spring Term 1- Programming variables in games Summer Term 2- Programming sensing	Year 7 Spring 1- Using Media Summer 1 and 2- Programming- Scratch	Year 8- Autumn 1 Vector graphics Summer 1- Mobile app development
Creating Media Select and create a range of media including text, images, sounds and video.	Pupils know: compare features in different video explain that video is a visual media format identify features of videos experiment with different camera angles	Pupils know: discuss the similarities and differences between 2D and 3D shapes explain why we might represent 3D objects on a computer select, move, and delete a digital 3D shape	Pupils know: Plan effective presentations for a given audience - Apply the key features of a word processor to format a document - Select appropriate images for a given context - Apply appropriate formatting techniques	Pupils know: Use HTML to structure static web pages - Modify HTML tags using inline styling to improve the appearance of web pages - Display images within a web page - Apply HTML tags to construct a web page

<p>identify and find features on a digital video recording device</p> <p>make use of a microphone</p> <p>capture video using a range of filming techniques</p> <p>review how effective a video is</p> <p>suggest filming techniques for a given purpose</p> <p>create and save video content</p> <p>decide which filming techniques to use</p> <p>outline the scenes of a video</p> <p>explain how to improve a video by reshooting and editing</p> <p>select the correct tools to make edits to a video</p> <p>store, retrieve, and export a recording to a computer</p> <p>evaluate a video and share opinions</p> <p>make edits to a video and improve the final outcome</p> <p>recognise that choices when making a video will impact on</p>	<p>change the colour of a 3D object</p> <p>identify how graphical objects can be modified</p> <p>resize a 3D object</p> <p>position 3D objects in relation to each other</p> <p>rotate a 3D object</p> <p>select and duplicate multiple 3D objects</p> <p>create digital 3D objects of an appropriate size</p> <p>group a digital 3D shape and a placeholder to create a hole in an object</p> <p>identify the 3D shapes needed to create a model of a real-world object</p> <p>choose which 3D objects is needed to construct a model</p> <p>modify multiple 3D objects</p> <p>plan a 3D model</p> <p>decide how a model can be improved</p>	<ul style="list-style-type: none"> - Evaluate online sources for use in own work - Construct a blog using appropriate software - Organise the content of the blog based on credible sources - Construct a blog using appropriate software - Organise the content of blog based on credible sources - Apply referencing techniques that credit authors appropriately 	<p>structure from a provided design</p> <ul style="list-style-type: none"> - Describe what CSS is - Use CSS to style static web pages - Assess the benefits of using CSS to style pages instead of in-line formatting - Create hyperlinks to allow users to navigate between multiple web pages - Draw basic shapes (rectangle, ellipse, polygon, star) with different properties (fill and stroke, shape-specific attributes) - Manipulate individual objects (select, move, resize, rotate, duplicate, flip, z-order) - Combine paths by applying operations (union, difference, intersection) - Convert objects to paths - Draw paths - Edit path nodes - Combine multiple tools and techniques to create a vector graphic design - Explain what vector graphics are - Provide examples where using vector graphics would be appropriate - Improve your own project work based on feedback
--	---	---	---

	<p>the quality of the final outcome</p> <p>discuss how a vector drawing is different from paper-based drawings</p> <p>identify the main drawing tools</p> <p>recognise that vector drawings are made using shapes</p> <p>explain that each element added to a vector drawing is an object</p> <p>identify the shapes used to make a vector drawing</p> <p>move, resize, and rotate objects I have duplicated</p> <p>explain how alignment grids and resize handles can be used to improve consistency</p> <p>modify objects to create different effects</p> <p>use the zoom tool to help me add detail to my drawings</p> <p>change the order of layers in a vector drawing</p> <p>identify that each added object creates a new layer in the drawing</p>	<p>evaluate a model against a given criterion</p> <p>modify a model to improve it</p>		
--	---	---	--	--

	<p>identify which objects are in the front layer or in the back layer of a drawing</p> <p>copy part of a drawing by duplicating several objects</p> <p>group to create a single object</p> <p>reuse a group of objects to further develop my vector drawing</p> <p>apply what I have learned about vector drawings</p> <p>suggest improvements to a vector drawing</p> <p>create alternatives to vector drawings</p>			
Where this is taught:	<p>Year 5 Autumn Term 2- Creating Media</p> <p>Spring Term 1- Selection in physical computing</p> <p>Summer Term 1- Creating Media</p> <p>Summer Term 2- Selection in quizzing</p>	<p>Year 6 Autumn Term 2- Creating media</p> <p>Spring Term 1- Programming variables in games</p> <p>Summer Term 2- Programming sensing</p>	<p>Year 7 Spring 1- Using Media</p> <p>Summer 1 and 2- Programming- Scratch</p>	<p>Year 8- Autumn 1 Vector graphics</p> <p>Summer 1- Mobile app development</p>
Effective use of tools Use software tools to support computing work	<p>Pupils know:</p> <ul style="list-style-type: none"> compare working online with working offline - I can make thoughtful suggestions on my group's work - I can suggest strategies to ensure successful group work 	<p>Pupils know:</p> <ul style="list-style-type: none"> compare results from different search engines - I can complete a web search to find specific information - I can refine my search 	<p>Pupils know:</p> <ul style="list-style-type: none"> a memorable and secure password for an account on the school network - Find personal documents and common applications - Recognise a respectful email 	<p>Pupils know:</p> <ul style="list-style-type: none"> the benefits of using CSS to style pages instead of in-line formatting - Use search technologies effectively - Discuss the impact of search technologies and the

	<ul style="list-style-type: none"> - I can explain how the internet enables effective collaboration - I can identify different ways of working together online - I can recognise that working together on the internet can be public or private - I can create and save video content - I can decide which filming techniques I will use - I can outline the scenes of my video - I can explain how to improve a video by reshooting and editing - I can select the correct tools to make edits to my video - I can store, retrieve, and export my recording to a computer - I can evaluate my video and share my opinions - I can make edits to my video and improve the final outcome - I can recognise that my choices when making a video will impact on the quality of the final outcome - I can create multiple questions about the same field - I can explain how information can be recorded - I can order, sort, and group my data cards - I can choose multiple criteria to answer a given question 	<ul style="list-style-type: none"> - I can explain why we need tools to find things online - I can recognise the role of web crawlers in creating an index - I can relate a search term to the search engine's index - I can explain that a search engine follows rules to rank relevant pages - I can explain that search results are ordered - I can suggest some of the criteria that a search engine checks to decide on the order of results - I can describe some of the ways that search results can be influenced - I can explain how search engines make money - I can recognise some of the limitations of search engines - I can choose methods of communication to suit particular purposes - I can explain the different ways in which people communicate - I can identify that there are a variety of ways of communicating over the internet - I can compare different methods of communicating on the internet - I can decide when I should and should not share 	<ul style="list-style-type: none"> - Construct an effective email and send it to the correct recipients - Describe how to communicate with peers online - Plan effective presentations for a given audience - Check who you are talking to online - Identify columns, rows, cells, and cell references in spreadsheet software - Use formatting techniques in a spreadsheet - Use the autofill tool to replicate cell data - Use basic formulas with cell references to perform calculations in a spreadsheet (+, -, *, /) - Collect and analyse data - Create appropriate charts in a spreadsheet - Use the functions SUM, COUNTA, MAX, and MIN in a spreadsheet - Use a spreadsheet to sort and filter data - Use the functions AVERAGE, COUNTIF, and IF in a spreadsheet - Use conditional formatting in a spreadsheet - Identify the key features of a word processor 	<ul style="list-style-type: none"> issues that arise by the way they function and the way they are used - Implement navigation to complete a functioning website - Draw basic shapes (rectangle, ellipse, polygon, star) with different properties (fill and stroke, shape-specific attributes) - Manipulate individual objects (select, move, resize, rotate, duplicate, flip, z-order) - Manipulate groups of objects (select, group/ungroup, align, distribute) Combine paths by applying operations (union, difference, intersection) - Convert objects to paths - Draw paths Edit path nodes - Combine multiple tools and techniques to create a vector graphic design - Implement and customise GUI elements to meet the needs of the user - Use user input in an event-driven programming environment - Use variables in an event-driven programming environment - Develop a partially complete application to
--	---	--	--	---

	<ul style="list-style-type: none"> - I can choose which field and value are required to answer a given question - I can outline how 'AND' and 'OR' can be used to refine data selection - I can explain the benefits of using a computer to create graphs - I can refine a chart by selecting a particular filter - I can select an appropriate chart to visually compare data - I can discuss how a vector drawing is different from paper-based drawings - I can identify the main drawing tools - I can recognise that vector drawings are made using shapes - I can explain that each element added to a vector drawing is an object - I can identify the shapes used to make a vector drawing - I can move, resize, and rotate objects I have duplicated - I can explain how alignment grids and resize handles can be used to improve consistency - I can modify objects to create different effects - I can use the zoom tool to help me add detail to my drawings 	<ul style="list-style-type: none"> - I can explain that communication on the internet may not be private - I can add content to my own web page - I can evaluate what my web page looks like on different devices and suggest/make edits - I can preview what my web page looks like - I can describe why navigation paths are useful - I can explain what a navigation path is - I can make multiple web pages and link them using hyperlinks - I can create hyperlinks to link to other people's work - I can evaluate the user experience of a website - I can explain the implication of linking to content owned by others - I can construct a formula in a spreadsheet - I can explain the relevance of a cell's data type - I can identify that changing inputs changes outputs - I can apply a formula to calculate the data I need to answer questions - I can explain why data should be organised - I can use a spreadsheet to answer questions 	<ul style="list-style-type: none"> - Apply the key features of a word processor to format a document - Evaluate formatting techniques to understand why we format documents - Select appropriate images for a given context - Apply appropriate formatting techniques - Construct a blog using appropriate software - Organise the content of the blog based on credible sources - Design the layout of the content to make it suitable for the audience - Construct a blog using appropriate software - Organise the content of blog based on credible sources 	<ul style="list-style-type: none"> include additional functionality - Identify and fix common coding errors - Use user input in a block-based programming language - Use variables in a block-based programming language - Use a block-based programming language to include sequencing and selection
--	---	--	--	--

	<ul style="list-style-type: none"> - I can change the order of layers in a vector drawing - I can identify that each added object creates a new layer in the drawing - I can identify which objects are in the front layer or in the back layer of a drawing - I can copy part of a drawing by duplicating several objects - I can group to create a single object - I can reuse a group of objects to further develop my vector drawing - I can ask questions that will need more than one field to answer - I can present my findings to a group - I can refine a search in a real-world context 	<ul style="list-style-type: none"> - I can apply a formula to multiple cells by duplicating it - I can create a formula which includes a range of cells - I can recognise that data can be calculated using different operations - I can discuss the similarities and differences between 2D and 3D shapes - I can explain why we might represent 3D objects on a computer - I can select, move, and delete a digital 3D shape - I can change the colour of a 3D object - I can identify how graphical objects can be modified - I can resize a 3D object - I can position 3D objects in relation to each other - I can rotate a 3D object - I can select and duplicate multiple 3D objects - I can create digital 3D objects of an appropriate size - I can group a digital 3D shape and a placeholder to create a hole in an object - I can identify the 3D shapes needed to create a model of a real-world object 		
--	---	---	--	--

		<ul style="list-style-type: none"> - I can choose which 3D objects I need to construct my model - I can modify multiple 3D objects - I can plan my 3D model - I can decide how my model can be improved - I can evaluate my model against a given criterion - I can modify my model to improve it - I can produce a graph - I can suggest when to use a table or graph - I can use a graph to show the answer to questions 		
Where this is taught:	Year 5 Autumn 1- Computer Systems Autumn 2- Creating Media Summer 1- Creating Media Spring 2- Data and Information- Flat-file databases	Year 6 Autumn 1- Computer Systems Spring 2- Data and information Spreadsheets Summer 1- Creating Media	Year 7 Autumn 1- Impact of technology Spring 1- Using Media Summer 2- Modelling data-spreadsheets	Year 8 Autumn 1- Media-vector Graphics Spring 1- Using Media Summer 1- Mobile app development

<p>Impact of technology How individuals, systems and society as a whole interact with computer systems</p>	<p>Pupils know:</p> <ul style="list-style-type: none"> • I can explain the benefits of a given computer system • I can identify tasks that are managed by computer systems • can identify the human elements of a computer system • can explain that the internet allows different media to be shared • I can recognise that connected digital devices can allow us to access shared files stored online • I can send information over the internet in different ways • I can describe some of the ways that search results can be influenced • I can explain how search engines make money • I can recognise some of the limitations of search engines • I can create hyperlinks to link to other people's work • I can evaluate the user experience of a website • I can explain the implication of linking to content owned by others 	<p>Pupils know:</p> <ul style="list-style-type: none"> • I can describe some of the ways that search results can be influenced • I can explain how search engines make money • I can recognise some of the limitations of search engines • I can create hyperlinks to link to other people's work • I can evaluate the user experience of a website • I can explain the implication of linking to content owned by others 	<p>Pupils know:</p> <ul style="list-style-type: none"> • Describe cyberbullying and explain the effects of cyberbullying • Describe how internet-connected devices can affect me • Demonstrate an understanding of licensing issues involving online content by applying appropriate Creative Commons licences • Demonstrate the ability to credit the original source of an image • Critique digital content for credibility • Apply referencing techniques and understand the concept of plagiarism • Evaluate online sources for use in own work • Organise the content of blog based on credible sources • Design the layout of the content to make it suitable for the audience 	<p>Pupils know:</p> <ul style="list-style-type: none"> • Provide broad definitions of 'artificial intelligence' and 'machine learning' • Identify examples of artificial intelligence and machine learning in the real world • Describe the steps involved in training machines to perform tasks (gathering data, training, testing) • Associate the use of artificial intelligence with moral dilemmas • Explain the implications of sharing program code
--	--	---	---	---

	Year 5 Autumn 1- Computer Systems	Year 6 Autumn 1- Computer Systems Year 6 Autumn 2- Creating Media	Year 7 Spring 1- Using Media	Year 8 Autumn 2- Computer Systems
Algorithms Being able to comprehend, design, create and evaluate algorithms	<p>Pupils know:</p> <ul style="list-style-type: none"> • conditions in a program • how to modify a condition in a program • how conditions are used in selection • how to create a program with different outcomes using selection • the condition and outcomes in an 'if... then... else...' statement • how to use selection in an infinite loop to check a condition • how to design the flow of a program which contains 'if... then... else...' • that program flow can branch according to a condition • that a condition can direct program flow in one of two ways 		<p>Pupils know:</p> <ul style="list-style-type: none"> • how humans and computers understand instructions (understand and carry out) • a sequence as instructions performed in order, with each executed in turn • the outcome of a simple sequence • how to modify a sequence • that computers follow the control flow of input/process/output • the outcome of a simple sequence that includes variables • the values of variables within a sequence • how to make a sequence that includes a variable • how to define a condition as an expression that will be evaluated as either true or • that selection uses conditions to control the flow of a sequence • where selection statements can be used in a program • how to modify a program to include selection 	<p>Pupils know:</p> <ul style="list-style-type: none"> • how search engines 'crawl' through the World Wide Web and how they select and rank results • how search engines select and rank results when searches are made • what algorithms and programs are and how they differ • when a problem needs to be broken down

			<ul style="list-style-type: none">• conditions that use comparison operators (>,<=)• conditions that use logic operators (and/or/not)• where selection statements can be used in a program that include comparison and logical operators• iteration as a group of instructions that are repeatedly executed• the need for iteration• where count-controlled iteration can be used in a program• how to implement count-controlled iteration in a program• how to Independently design and apply programming constructs to solve a problem (subroutine, selection, count-controlled iteration, operators, and variables)• a subroutine as a group of instructions that will run when called by the main program or other subroutines• decomposition as breaking a problem down into smaller, more manageable subproblems• how subroutines can be used for decomposition	
--	--	--	--	--

			<ul style="list-style-type: none"> • appropriate constructs to solve a problem • How to decompose a larger problem into smaller subproblems • appropriate constructs to solve a problem 	
Where this is taught:	Year 5- Summer 2- Programming- Repetition in shapes		Year 7- Spring 2- Programming essentials in Scratch- Part I Summer 1- Programming essentials in Scratch- Part II	Year 8- Spring 1- Developing for the web Summer 1-Mobile app development Summer 2- Introduction to Python programming
Safety and security Understanding risks when using technology and how to protect individuals and systems	Pupils know: <ul style="list-style-type: none"> • they can capture video using a range of filming techniques • how to review how effective their video is • filming techniques for a given purpose 	Pupils know: <ul style="list-style-type: none"> • what is meant by the term 'fair use' • how to find copyright-free images • why they should use copyright-free images 	Pupils know: <ul style="list-style-type: none"> • how to create a memorable and secure password for an account on the school network • how to communicate with peers online • the effects of cyberbullying • how to check who you are talking to online • how internet-connected devices can affect them 	Pupils know: <ul style="list-style-type: none"> • the impact of search technologies and the issues that arise by the way they function and the way they are used
Where this is taught:	Year 5- Autumn 2- Creating media- video editing	Year 6- Autumn 2- Creating media- web page creation	Year 7- Autumn 1- Impact of technology Autumn 2- Networks from semaphore to internet	Year 8- Spring 1- Developing for the web
Curriculum Impact: Live: Ensure pupils develop skills and personal qualities for lifelong learning so that they can make an active contribution to society <ul style="list-style-type: none"> • Pupils will be prepared to move from their current year group to the next one because the curriculum we follow covers all the units and lessons described in the N.C.C.E.'s innovative progression framework for years 5 to 8. • KS3 pupils in particular are encouraged to use their problem solving skills to ensure they are upper school ready. Love: Broaden pupils' horizons by giving them opportunities to explore the wider world				

- Motivated pupils work beyond the syllabus by taking part in a variety of extracurricular activities covering server set-up, robotics and programming.
- KS3 pupils are encouraged to consider the range of job opportunities available in the technology sector as well as to keep abreast of current news stories and research developments.

Learn: Develop independent, confident and successful learners who achieve the best possible academic standards, whatever their starting point.

- KS2 pupils attain broadly in line with national averages, given their starting points. Attainment is gauged at the start and end of each lesson as well as at the end of a unit.
- Progress is tracked across the four years and is expected to be at least good.