Edwinstree
Middle School
Voluntary Controlled
Church of England

Computing Curriculum Map 2024-2025

Version 1.0

	Year 5	Year 6	Year 7	Year 8
Autumn / Spring / Summer 2024 – 2025	1. Introduction to computers and using them safely	1. Working collaboratively - email, cloud computing	1. Digital forensics - eSafety	1. Internet and HTML
	4th – 15th NOV 2024 – 'BEBRAS' COMPUTATIONAL THINKING CHALLENGE (ALL YEARS)			
	2. Introduction to spreadsheets	2. Creating algorithms to draw 2D shapes (Scratch)	2. How a computer works	2. Python (Programming)
	3. Block based programming - Scratch	3. The Internet - Networks / Encryption / HTML	3. Microbit intro - sequence, iteration	3. Microbit (Rock Paper Scissors & Bluetooth networking)
	4. Graphics	4. Creating 3D graphics (TinkerCAD)	4. Python programming (Edublocks)	4. Binary and logic
	5. Creating a video	5. Control systems – traffic light project	5. Creating Vector Images	5. Data representation – images and sound

INDEPENDENT / GROUP LEARNING IN CLASS

Students to choose from a library of mini projects.

National Curriculum Statements for Key Stage 2 (Years 3 to 6)

Pupils should be taught to:

[1.KS2] design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

[2.KS2] use sequence, selection, and repetition in programs; work with variables and various forms of input and output

[3.KS2] use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

[4.KS2] 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

[5.KS2] use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content

[6.KS2] 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

[7.KS2] use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

	Year 5	Year 6
Autumn / Spring / Summer 2024-2025	Introduction to computers and using them safely [5.KS2][7.KS2]	Working collaboratively - email, cloud computing [6.KS2]
	Bebras [1.KS2][3.KS2]	Bebras [1.KS2][3.KS2]
	Introduction to spreadsheets [6.KS2]	Creating algorithms to draw shapes [1.KS2][2.KS2]
	Block based programming – Scratch [1.KS2][2.KS2][3.KS2]	Networking - The Internet [4.KS2]
	Graphics [6.KS2]	Creating 3D graphics (TinkerCAD) [6.KS2]
	Creating a video [6.KS2]	Control systems – traffic light project [1.KS2]

INDEPENDENT / GROUP LEARNING IN CLASS

Students to choose from a library of mini projects.

How will the Key Stage 2 Curriculum be implemented at Edwinstree? Some of these National Curriculum statements will have been covered before Edwinstree in Year 3 and 4.		
Threshold Concept	**Year 5**	**Year 6**
Design, write and debug programs that accomplish specific goals, including the use of sequences, selection, repetition and variables. Use logical reasoning to explain how some simple algorithms work. Explore the use of a micro:bit as an external programmable device.	Can I import a sprite in Scratch and make it move? Can I use "Forever" and "Repeat" loops? Can I write instructions to draw simple shapes? Can I make a sprite change costume and use the "wait" function? Can I use the "If" statement to make a decision in a program? Can I use X and Y coordinates to control the position of sprites? All students will participate in the https://www.bebras.uk/ challenge – a worldwide venture to teach and develop computational thinking. Can I explain computational thinking? Can I use abstraction? Can I use decomposition? Can I use pattern recognition? Can I use algorithms? Can I demonstrate my computational thinking in the Bebras challenge?	Can I define an algorithm? Can I create an algorithm? Can I create a range of 2D-shapes using repeated steps? Can I create a range of 2D-shapes using looped steps? Can I create a user-defined 2D-shape using variables to determine number of sides? Can I create a program to run on a controllable device using my knowledge of computer programming? Can I test my program on an emulator? Can I transfer a program to an external device such as a micro:bit? Can I determine the flow of a program to create a fixed sequence, such as a traffic light? All students will participate in the https://www.bebras.uk/ challenge – a worldwide venture to teach and develop computational thinking. Can I explain computational thinking? Can I use abstraction? Can I use decomposition? Can I use pattern recognition? Can I use algorithms? Can I demonstrate my computational thinking in the Bebras challenge?

Understanding different types of computer network including the internet.	Can I recognise the different parts of a web address?	Can I explain what a network is and understand some of the vocabulary associated with it? Can I identify the hardware needed to create a LAN? Can I define the Internet and what I use it for? Can I understand how data travels across the Internet? Can I explain how data is encrypted? Can I decode basic encryption? Can I explain how encryption works on the Internet? Can I explain the importance of safety on the Internet?
Use search technologies effectively.	Can I search the internet for information? Can I understand that information comes in different forms?	Can I search the internet for information? Can I understand that information comes in different forms?
Select, use and combine a variety of software on a range of digital devices to create a range of programs, systems and content to accomplish given goals. Use Microsoft 365 to create resources using different apps and the cloud environment, collaborating with others to improve productivity and efficiency.	Can I understand the purpose of a spreadsheet application? Can I identify the key parts of a spreadsheet and recognise sheets, rows, columns and formula? Can I format a spreadsheet to meet a specific purpose? Can I accurately change the variables in a spreadsheet to perform the desired outcome? Can I demonstrate that spreadsheets are able to model different scenarios? Can I create a simple presentation? Can I collaborate as a team to create a joint presentation? Can I provide feedback to others about their work? Can I use feedback to improve my work? Can I create a more complex presentation using a variety of tools including multimedia?	Can I add formulae to a spreadsheet to calculate totals? Can I use conditional formatting? Can I show understanding of autofill and absolute cell references? Can I use the sort options in Excel? Can I use a spreadsheet to present information and solve a problem?

Select, use and combine a variety of software to produce a range of media.	Can I manipulate graphics by resizing, rotating and cropping? Can I use graphics in a variety of applications, including adding/removing/modifying, along with other image effects? Can I use and manipulate animated graphics to demonstrate an idea or provide a more visual piece of work? Can I create a jigsaw using a picture or graphic in Powerpoint? Can I compare, explain and identify the different features of a video? Can I explore and use a digital recording device to make videos, exploring camera angles and other techniques? Can I plan and create a storyboard? Can I import video and effectively use video-editing software? Can I evaluate and feedback about media projects from other students? Can I use feedback to improve my media?	Can I work in three dimensions on a computer by manipulating 3D shapes in a project, including adding, viewing, moving, resizing, duplicating and grouping? Can I plan and create a 3D model for a given purpose using precise measurements, placeholders and other learned techniques? Can I explain how my 3D model could be improved using feedback from others?
Use technology safely, respectfully and responsibly.	Can I log onto the network and access documents? Do I understand the basic safety rules in the Computer Room and the Internet? Can I type on a keyboard? Can I recognise if a website is reliable or not? Can I understand that not all information found on the internet is reliable?	Can I log onto the network and access documents? Do I understand the basic safety rules in the Computer Room and the Internet? Can I recognise if a website is reliable or not? Can I understand that not all information found on the internet is reliable?

National Curriculum Statements for Key Stage 3 (Years 7 to 9)

Pupils should be taught to:

[1.KS3] design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems

[2.KS3] understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem

[3.KS3] use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions

[4.KS3] understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example,binary addition, and conversion between binary and decimal]

[5.KS3] understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems

[6.KS3] understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits

[7.KS3] undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users

[8.KS3] create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability

[9.KS3] understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns.

	Year 7	Year 8
Autumn / Spring / Summer 2024-2025	Digital forensics – eSafety [9.KS3]	Internet and HTML [3.KS3]
	Bebras [1.KS3][2.KS3]	Bebras [1.KS3][2.KS3]
	How a computer works [5.KS3][6.KS3]	Python (Programming) [3.KS3]
	Microbit intro - sequence, iteration [1.KS3]	Microbit (Rock Paper Scissors & Bluetooth networking) [7.KS3]
	Python programming (Edublocks) [3.KS3]	Binary and logic [4.KS3]
	Creating vector images [8.KS3]	Data Representation [7.KS3]

INDEPENDENT / GROUP LEARNING IN CLASS

Students to choose from a library of mini projects.

How will the Key Stage 3 Curriculum be implemented at Edwinstree?

Some of these National Curriculum statements will be covered beyond Edwinstree in Year 9.

Threshold Concept	Year 7	Year 8
Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems.		Can I work in three dimensions on a computer by manipulating 3D shapes in a project, including adding, viewing, moving, resizing, duplicating and grouping? Can I plan and create a 3D model for a given purpose using precise measurements, placeholders and other learned techniques? Can I explain how my 3D model could be improved using feedback from others?
Understand several key algorithms that reflect computational thinking. Use logical reasoning to compare the utility of alternative algorithms for the same problem.	All students will participate in the https://www.bebras.uk/ challenge – a worldwide venture to teach and develop computational thinking. Can I explain computational thinking? Can I use abstraction? Can I use decomposition? Can I use pattern recognition? Can I use algorithms? Can I demonstrate my computational thinking in the Bebras challenge?	All students will participate in the https://www.bebras.uk/ challenge – a worldwide venture to teach and develop computational thinking. Can I explain computational thinking? Can I use abstraction? Can I use decomposition? Can I use pattern recognition? Can I use algorithms? Can I demonstrate my computational thinking in the Bebras challenge?
Use two or more programming languages to solve a variety of computational problems including make appropriate use of data structures, while designing and developing modular programs that use procedures or functions.	Can I use my Scratch knowledge to help my introduction to Python (EduBlocks)? Can I explain and use basic coding concepts? Can I recall algorithms and sequencing? Can I use Turtle to draw shapes and patterns? Can I explain and use iteration? Can I explain user input in Python?	Can I explain why machines need translators when executing programs? Can I predict the outcome of a selection block? Can I create a trace table to track the state and output of a selection block? Can I use comments to explain how my program works?

Threshold Concept	Year 7	Year 8
	Can I recognise and understand errors in Python? Can I explain and use basic data types? Can I use logic in Python? Can I learn about and use variables? Can I learn about functions, including arguments, and subroutines? Can I use functions with Turtle? Can I plan and build a project in Turtle demonstrating everything I've learned?	Can I use print statements to debug my programs? Can I describe selection and branching in my programs? Can I arrange Edublocks into a selection statement with the options IF and ELSE? Can I use the selection statements IF and ELSE? Can I use relational operators? Can I use random numbers and modules?
Understand simple Boolean logic using logic gates.		Can I explain logic gates? Can I explain and demonstrate the use of the different types of logic gate?
Understand the binary number system, demonstrating its use by carrying out simple operations with binary numbers.	Can I explain what binary is? Can I explain why computers use binary? Can I convert from denary to binary and vice-versa?	Can I explain the reason why computers use binary numbers? Can I convert numbers between the denary (10 base) and binary (2 base) number systems? Can I explain how LEDs work?
Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems.	Can I identify whether hardware is input and/or output? Can I identify different types of storage? Can I explain what other hardware is inside a computer? Can I distinguish and choose between different types of hardware? Can I explain the difference between hardware and software? Can I explain what a robot is and how they contain an embedded computer? Can I explain how computers are used by people with disabilities? Can I create a persuasive argument about computers and robotics? Can I explain what a micro:bit is?	Can I recall what a micro:bit is, and how to use the MakeCode website? Can I make a simple .hex program and transfer it to the micro:bit? Can I explain how BIOS works? Can I explain the IoT? Can I explain how inputs and outputs can take many different forms? Can I explain what an embedded system is? Can I explain what causes unexpected outputs? Can I create a simple flow chart using input, output, process and decisions? Can I create a simple user interface? Can I test a program? Can I explain what a micro:bit is? Can I describe the key parts of a micro:bit?

Threshold Concept	Year 7	Year 8
	Can I describe the key parts of a micro:bit? Can I create programs to operate the micro:bit? Can I download my programming code to the micro:bit? Can I develop and create a game for the micro:bit?	Can I create programs to operate the micro:bit? Can I download my programming code to the micro:bit? Can I develop and create a game for the micro:bit?
Understand how instructions are stored and executed within a computer system. Understand how data of various types can be represented and manipulated digitally in the form of binary digits.		Can I describe the composition of digital images? Can I explain picture colours using my knowledge of binary digits? Can I explain key terms including pixels, resolution and colour depth? Can I explain how data is represented in an image using terms such as sequences and bits? Can I explain colour using RGB mixtures and colour intensity (bit sequences)? Can I compute the representation size of a digital image? Can I explain representation size and perceived quality for digital images? Can I recall the physics of sound? Can I explain the function of microphones and speakers? Can I explain key terms including sample, sampling frequency/rate and sample size? Can I explain how data is represented in a sound using terms such as sequences and bits? Can I calculate representation size for a given digital sound? Can I explain representation size and perceived quality for sound, using terms including sampling frequency and sampling size? Can I perform basic sound editing tasks using appropriate software and combine them in order to

Threshold Concept	Year 7	Year 8
		solve more complex problems requiring sound manipulation?
Undertake creative projects that involve selecting, using, and combining multiple applications to achieve challenging goals, collecting and analysing data to meet the needs of known users.	Can I draw basic shapes (rectangle, ellipse, polygon, star) with different properties (fill and stroke, shape-specific attributes)? Can I manipulate individual objects (select, move, resize, rotate, duplicate, flip, z-order)? Can I manipulate groups of objects (select, group/ungroup, align, distribute)? Can I combine paths by applying operations (union, difference, intersection)? Can I convert objects to paths, draw paths and edit path nodes? Can I combine multiple tools and techniques to create a vector graphic design? Can I explain what vector graphics are and provide examples where using vector graphics would be appropriate? Can I evaulate others' work and improve my own project work based on feedback?	Can I draw basic shapes (rectangle, ellipse, polygon, star) with different properties (fill and stroke, shape-specific attributes)? Can I manipulate individual objects (select, move, resize, rotate, duplicate, flip, z-order)? Can I manipulate groups of objects (select, group/ungroup, align, distribute)? Can I combine paths by applying operations (union, difference, intersection)? Can I convert objects to paths, draw paths and edit path nodes? Can I combine multiple tools and techniques to create a vector graphic design? Can I explain what vector graphics are and provide examples where using vector graphics would be appropriate? Can I evaulate others' work and improve my own project work based on feedback?
Create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability.		Can I describe the purpose of HTML and tags when designing a website? Can I create a simple webpage using basic tags? Can I describe what is meant by the term accessibility? Can I extend an HTML page to include images and hyperlinks? Can I identify the common features of existing websites and the basics of what makes good web design? Can I design and create pages for a mini website? Can I create hyperlinks between pages, and insert images, stored locally within a folder?

Threshold Concept	Year 7	Year 8
		Can I describe the purpose of CSS and why it is needed in addition to HTML? Can I use CSS to change the style of HTML tags? Can I describe the purpose of DIV tags? Can I apply CSS to DIVs within webpages using classes? Can I explain how to plan a website by developing a house style and sketched wireframe? Can I describe the box model in CSS? Can I construct a three-page website to showcase my skills? Can I improve my website using peer feedback?
Understand a range of ways to use technology safely, respectfully, responsibly and securely. Recognise inappropriate content, contact and conduct and know how to report concerns.	Can I explore and analyse digital artefacts to reveal information about a person? Can I explain what data digital devices store about their users? Can I explain the concept of privacy and whether location tracking is private or not? Can I explain the ethical issues of online adverts? Can I explain metadata? Can I explain how to protect myself against unwanted attention online? Can I explain a brute force attack? Can I explain VPNs, cookies and Internet search histories? Can I explain and avoid being a victim of online grooming?	Can I explore and analyse digital artefacts to reveal information about a person? Can I explain what data digital devices store about their users? Can I explain the concept of privacy and whether location tracking is private or not? Can I explain the ethical issues of online adverts? Can I explain metadata? Can I explain how to protect myself against unwanted attention online? Can I explain a brute force attack? Can I explain VPNs, cookies and Internet search histories? Can I explain and avoid being a victim of online grooming?