COMPUTING KNOWLEDGE & SKILLS PROGRESSION – We are Programmers

"Technology will never replace great teachers but technology in the hands of great teachers is transformational." George Couros

We want our children to be highly equipped to respond to the fast moving and rapidly evolving technological world. Our Computing curriculum teaches children to understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation. Computer science and applying its principles into programming is taught from Year 3 to Year 6 as our children learn to analyse problems and evaluate and apply information technology analytically to solve problems.

We have designed a curriculum that teaches a progression of knowledge, skills and understanding. New learning is taught in each learning programme and specific skills are repeated and practised in subsequent terms to ensure a depth of knowledge. Our programmes of learning are taught with a cross curricular perspective, when appropriate, to allow children to understand the interconnections between technology and other subjects. Science, mathematics and design are strongly connected to the curriculum and children are taught to recognise and learn from these connections.

The curriculum has been designed so that online safety is continuously taught throughout each term (see RSHE curriculum)

Our pupils learn to:

- understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
- create and debug simple programs
- use logical reasoning to predict the behaviour of simple programs
- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- 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
- understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration
- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Online Safety

- recognise common uses of information technology beyond school

- use technology safely and respectfully, keeping personal information private;
- identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.
- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Key Stage 2 Computing Curriculum

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology.

Pupils should be taught to:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration
- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

A journey through our Computing curriculum:

	Autumn 1	Spring 1	Spring 2	Summer 1	Summer2
Year 3	**Computing systems and networks connecting computers** **linked to PSHE online safety**	**Creating Media stop frame animation** **Linked to English or History curriculum**	**Programming sequencing sounds** **Linked to Science curriculum**	**Data and information branching databases** **Linked to Science, History or Geography curriculum**	**Creating media desk top publishing** **Linked to English, History or Geography curriculum**
Unit introduction	Learners will develop their understanding of digital devices, with an initial focus on inputs, processes, and outputs. They will also compare digital and non-digital devices. Next, learners will be introduced to computer networks, including devices that make up a network's infrastructure, such as wireless access points and switches. Finally, learners will discover the benefits of connecting devices in a network	Learners will use a range of techniques to create a stop-frame animation. Next, they will apply those skills to create a story-based animation. This unit will conclude with learners adding other types of media to their animation, such as music and text.	This unit explores the concept of sequencing in programming through Scratch. It begins with an introduction to the programming environment, which will be new to most learners. They will be introduced to a selection of motion, sound, and event blocks which they will use to create their own programs, featuring sequences. The final project is to make a representation of a piano. The unit is paced to focus on all aspects of sequences, and make sure that knowledge is built in a structured manner. Learners also apply stages of program design through this unit.	Learners will develop their understanding of what a branching database is and how to create one. They will use yes/no questions to gain an understanding of what attributes are and how to use them to sort groups of objects. Learners will create physical and on-screen branching databases. To conclude the unit, they will create an identification tool using a branching database, which they will test by using it. They will also consider real-world applications for branching databases.	Learners will become familiar with the terms 'text' and 'images' and emojis and understand that they can be used to communicate messages offline and online. They will use desktop publishing software and consider careful choices of font size, colour and type to edit and improve premade documents. Learners will be introduced to the terms 'templates', 'orientation', and 'placeholders' and begin to understand how these can support them in making their own template for a magazine front cover. They will start to add text and images to create their own pieces of work using desktop publishing software. Learners will look at a range of page layouts thinking carefully about the purpose of these and evaluate how and why desktop publishing is used in the real world.

National Curriculum	**Computing** -use sequence, selection, and repetition in programs; work with variables and various forms of input and output -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 -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 -use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	**Computing** -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 -use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact **English** -Pupils should be taught to: draft and write by: in narratives, creating settings, characters and plot -Pupils should be taught to: proof-read for spelling and punctuation errors **History** -The Roman Empire and its impact on Britain	**Computing** -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 -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	**Computing** -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 -use technology safely, respectfully and responsibly	**Computing** -Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content -Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information **English** -Pupils should be taught to draft and write by: in non-narrative material, using simple organisational devices [for example, headings and subheadings] -Evaluate and edit by assessing the effectiveness of their own and others' writing and suggesting improvements -Proofread for spelling and punctuation errors.
Vocabulary	digital device, input, process, output, program, digital, non-digital, connection, network, switch, server, wireless access point, cables, sockets	animation, flip book, stopframe, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency, evaluation, delete, media, import, transition	Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, sequence, event, task, design, run the code, order, note, chord, algorithm, bug, debug, code	attribute, value, questions, table, objects, branching, database, objects, equal, even, separate, structure, compare, order, organise, selecting, information, decision tree.	text, images, advantages, disadvantages, communicate, font, style, landscape, portrait, orientation, placeholder, template, layout, content, desktop publishing, copy, paste, purpose, benefits

Year 4	**Autumn**	**Spring**	**Summer 1**	**Summer 2**
	Computing systems and networks – The Internet **Linked to PSHE online safety**	**Creating Media – Audio Production** **Linked to English or Science curriculum**	**Programming repetition in shapes** **Linked to Science curriculum**	**Data and Information – data logging** **Linked to Science, History or Geography curriculum**

Unit Introduction	Learners will apply their knowledge and understanding of networks, to appreciate the internet as a network of networks which need to be kept secure. They will learn that the World Wide Web is part of the internet, and will be given opportunities to explore the World Wide Web for themselves in order to learn about who owns content and what they can access, add, and create. Finally, they will evaluate online content to decide how honest, accurate, or reliable it is, and understand the consequences of false information	Learners will identify the input device (microphone) and output devices (speaker or headphones) required to work with sound digitally. Learners will discuss the ownership of digital audio and the copyright implications of duplicating the work of others. In order to record audio themselves, learners will use Audacity to produce a podcast, which will include editing their work, adding multiple tracks, and opening and saving the audio files. Finally, learners will evaluate their work and give feedback to their peers.	Learners will create programs by planning, modifying, and testing commands to create shapes and patterns. They will use Logo, a text-based programming language. This unit is the first of the two programming units in Year 4 and looks at repetition and loops within programming.	In this unit, learners will consider how and why data is collected over time. Learners will consider the senses that humans use to experience the environment and how computers can use special input devices called sensors to monitor the environment. Learners will collect data as well as access data captured over long periods of time. They will look at data points, data sets, and logging intervals. Learners will spend time using a computer to review and analyse data. Towards the end of the unit, learners will pose questions and then use data loggers to automatically collect the data needed to answer those questions.

National Curriculum	**Computing** -Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration -Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content -Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information -Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	**Computing** -Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content -Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information -Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact **Science** **-Sound:** Find patterns between the volume of a sound and the strength of the vibrations that produced it **-Sound:** Recognise that sounds get fainter as the distance from the sound source increases **English Writing** Plan their writing by discussing and recording ideas - In non-narrative material, using simple organisational devices [for example, headings and subheadings] -Read aloud their own writing, to a group or the whole class, using appropriate intonation and controlling the tone and volume so that the meaning is clear.	**Computing** -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 -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	**Computing** -Use sequence, selection, and repetition in programs; work with variables and various forms of input and output -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 **Science** -Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. -They should learn how to use new equipment, such as data loggers, appropriately. They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. **Maths** -interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. -solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs
Vocabulary	internet, network, router, security, switch, server, wireless access point (WAP), website, web page, web address, routing, web browser, World Wide Web, content, links, files, use, download, sharing, ownership, permission, information, accurate, honest, content, adverts	audio, microphone, speaker, headphones, input device, output device, sound, podcast, edit, trim, align, layer, import, record, playback, selection, load, save, export, MP3, evaluate, feedback.	Logo (programming environment), program, turtle, commands, code snippet, algorithm, design, debug, pattern, repeat, repetition, count-controlled loop, value, trace, decompose, procedure.	data, table, layout, input device, sensor, logger, logging, data point, interval, analyse, dataset, import, export, logged, collection, review, conclusion.

Year 5	Autumn	Spring	Summer 1	Summer 2
	Computing systems and networks – systems and searching **Linked to PSHE online safety**	**Creating media – video production** **Linked to English, History, Geography or RE curriculum**	**Programming – selection in physical computing** **Linked to Science or DT curriculum**	**Data and information – flat file databases** **Linked to Science, History or Geography curriculum**
Unit introduction	Learners develop their understanding of computer systems and how information is transferred between systems and devices. Learners consider small-scale systems as well as large-scale systems. They explain the input, output, and process aspects of a variety of different real-world systems. Learners discover how information is found on the World Wide Web, through learning how search engines work (including how they select and rank results) and what influences searching, and through comparing different search engines	Learners will learn how to create short videos by working in pairs or groups. As they progress through this unit, they will be exposed to topic-based language and develop the skills of capturing, editing, and manipulating video. Learners are guided with step-by-step support to take their idea from conception to completion. At the conclusion of the unit, learners have the opportunity to reflect on and assess their progress in creating a video.	Learners will use physical computing to explore the concept of selection in programming through the use of the Crumble programming environment. Learners will be introduced to a microcontroller (Crumble controller) and learn how to connect and program it to control components (including output devices — LEDs and motors). Learners will be introduced to conditions as a means of controlling the flow of actions in a program. Learners will make use of their knowledge of repetition and conditions when introduced to the concept of selection (through the 'if...then...' structure) and write algorithms and programs that utilise this concept. To conclude the unit, learners will design and make a working model of a fairground carousel that will demonstrate their understanding of how the microcontroller and its components are connected, and how selection can be used to control the operation of the model. Throughout this unit, learners will apply the stages of programming design.	Learners will look at how a flat-file database can be used to organise data in records. Learners will use tools within a database to order and answer questions about data. They will create graphs and charts from their data to help solve problems. They will also use a real-life database to answer a question, and present their work to others.

National curriculum	**Computing** -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 **RSHE and online safety** -Pupils should know how to be a discerning consumer of information online, including that from search engines, is ranked, selected and targeted -I can explain what a strong password is and demonstrate how to create one	**Computing** -Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content -Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information -Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	**Computing** -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 -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 **Science** -Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches, and buzzers **DT** -Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces, and computer-aided design -Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining, and finishing], accurately -Select from and use a wider range of materials and components, including construction materials, textiles, and ingredients, according to their functional properties and aesthetic qualities -Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work -Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers, and motors] -Apply their understanding of computing to program, monitor, and control their products.	**Computing** -Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content -Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information. **Maths – statistics** -complete, read and interpret information in tables, including timetables.

Vocabulary	System, connection, digital, input, process, storage, output, search, search engine, refine, index, bot, ordering, links, algorithm, search engine optimisation (SEO), web crawler, content creator, selection, ranking.	Video, audio, camera, talking head, panning, close up, video camera, microphone, lens, mid-range, long shot, moving subject, side by side, angle (high, low, normal), static, zoom, pan, tilt, storyboard, filming, review, import, split, trim, clip, edit, reshoot, delete, reorder, export, evaluate, share.	Microcontroller, USB, components, connection, infinite loop, output component, motor, repetition, count-controlled loop, Crumble controller, switch, LED, Sparkle, crocodile clips, connect, battery box, program, condition, Input, output, selection, action, debug, circuit, power, cell, buzzer	Database, data, information, record, field, sort, order, group, search, value, criteria, graph, chart, axis, compare, filter, presentation.
Year 6	**Autumn**	**Spring**	**Summer 1**	**Summer 2**
	Computing systems and networks – communication and collaboration **Linked to RSHE and online safety**	**Creating media – webpage creation** **Linked to English, History or Geography curriculum**	**Programming – variables in games** **Linked to Science, History or Geography curriculum**	**Data and information – introduction to spreadsheets** **Linked to Science, History, Geography or Maths**
Unit introduction	Learners will explore how data is transferred over the internet. Learners initially focus on addressing, before they move on to the makeup and structure of data packets. Learners then look at how the internet facilitates online communication and collaboration; they complete shared projects online and evaluate different methods of communication. Finally, they learn how to communicate responsibly by considering what should and should not be shared on the internet and how to report concerns about inappropriate content online.	Learners will be introduced to creating websites for a chosen purpose. Learners identify what makes a good web page and use this information to design and evaluate their own website using Google Sites. Throughout the process, learners pay specific attention to copyright, fair use of media and creative commons, the aesthetics of the site, and navigation paths. This will enable the learners to understand how to be a respectful and responsible user of technology online.	Learners will explore the concept of variables in programming through games in Scratch. First, learners find out what variables are and relate them to real-world examples of values that can be set and changed. Then they use variables to create a simulation of a scoreboard. In Lessons 2, 3, and 5, which follow the Use-Modify-Create model, learners experiment with variables in an existing project, then modify them, before they create their own project. In Lesson 4, learners focus on design. Finally, in Lesson 6, learners apply their knowledge of variables and design to improve their games in Scratch.	Learners explore spreadsheets. They will be supported in organising data into columns and rows to create their own data set. Learners will be taught the importance of formatting data to support calculations, while also being introduced to formulas and will begin to understand how they can be used to produce calculated data. Learners will be taught how to apply formulas that include a range of cells, and apply formulas to multiple cells by duplicating them. Learners will use spreadsheets to plan an event and answer questions. Finally, learners will create charts, and evaluate their results in comparison to questions asked.

National curriculum	**Computing** -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 -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 -Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	**Computing** -Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content -Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information. -use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour. **English** -Writing composition: Identifying the audience for and purpose of the writing, selecting the appropriate form, and using other similar writing as models for their own.	**Computing** -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 -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	**Computing** -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 **Maths** -Solve problems involving addition, subtraction, multiplication, and division -Interpret and construct pie charts and line graphs, and use these to solve problems -Calculate and interpret the mean as an average
Vocabulary	Communication, protocol, data, address, Internet Protocol (IP), Domain Name Server (DNS), packet, header, data payload, chat, explore, slide deck, reuse, remix, collaboration, internet, public, private, oneway, two-way, one-to-one, one-to-many.	Website, web page, browser, media, Hypertext Markup Language (HTML), logo, layout, header, media, purpose, copyright, fair use, home page, preview, evaluate, device, Google Sites, breadcrumb trail, navigation, hyperlink, subpage, evaluate, implication, external link, embed.	variable, change, name, value, set, design, event, algorithm, code, task, artwork, program, project, code, test, debug, improve, evaluate, share, assign, declare	data, collecting, table, structure, spreadsheet, cell, cell reference, data item, format, formula, calculation, spreadsheet, input, output, operation, range, duplicate, sigma, propose, question, data set, organised, chart, evaluate, results, sum, comparison, software, tools.

What our pupils have experienced - a journey through MIANS KS1 Computing Curriculum

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Create simple sequence algorithms using symbols (e.g. Bee-Bot cards).	Programme (code) a computer using a number of steps in order before pressing the 'run' button. Identify where in the code or algorithm bug/ problem occurs.	Give explanations for what a programme will do.	Use a range of digital devices to create and store content e.g taking a photo, videoing, artwork. Create original content using digital devices.	Show awareness of how IT is used for communication beyond school.	How to keep safe when using digital technology. Explain what to do to keep safe. To know that information on the internet can be seen by others. What to do if disturbing content is seen online at school or home.
Year 2	Read and follow written sequence algorithms (forward 3, right 90)	Create a simple programme on screen with a particular goal or purpose in mind. Independently debug any errors in own code.	Give logical explanations for what a programme will do.	Use a range of digital devices to create store and retrieve content. Edit original digital content using a range of technologies.	Name a number of ways IT is used beyond school e.g. sharing work on online communities, web, email, analyse data.	How to keep safe on the internet and explain this. Show respect to others while using digital technology. Respect others' rights, privacy and intellectual property. Know not to share personal information online. Have a range of strategies for dealing with concerns over content or contact online.

ASPIRATIONS FOR THE FUTURE

Pupils develop an understanding of how subjects and specific skills are linked to future jobs. Here are some of the jobs you could aspire to do in the future as a programmer:

Cyber security analyst, Software engineer, Systems analyst, Web designer/developer, UX designer, Game designer/developer, Forensic computer analyst, Database administrator, IT consultant.

Our feeder high school snapshot Computing curriculum:

Jane Austen College

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
7	Online Safety	Computer Systems	Computational Thinking and Algorithms	Computational Thinking and Algorithms	CAD/CAM	CAD/CAM
8	Cyber Security	Data Handling	Programming Fundamentals	Programming Fundamentals	DT Project	DT Project
9	Networking	Data Representation	Data Representation	Programming with confidence	DT Project	DT Project
10	Data Representation	Programming Fundamentals	Software & Secondary Storage	Wired & Wireless Networks and Network Security	Computational Logic	Systems Architecture
11	Impacts of Technology	Translators and facilities of language	Producing robust programs	Extended Programming project	Revision and Exam Practice	Revision and Exam Practice

Open Academy

Key Stage 3 Computing

We have developed a curriculum across Key Stage 3 that follows the National Computing curriculum. It develops and challenges our students and includes but is not limited to: E-safety, sound editing, digital imaging using Adobe software. Desktop publishing, word processing, spreadsheet modelling and formal electronic communication using Microsoft Office. 2D/3D Animation using Alice/ Sketchup /Blender and both visual and text based programming in Scratch/Alice, MIT App Inventor and Small Basic/C# respectively.

Key Stage 4 Computer Science and IT

Within Key Stage 4, there are two courses available to all students to opt for. These qualifications are the BTEC Digital Information Technology and the AQA GCSE Computer Science and the BTEC Digital Information Technology. The former is a creative course exploring user interface (UI) with modern digital content, such as cloud computing and cyber security. We aim to draw upon the students' imagination and creativity in the design, production and refinement of a UI. By contrast the AQA GCSE Computer Science is a more mathematically grounded subject where students embark upon an exciting journey through programming and computer systems with an assignment in Year 11 involving students creating their own programs. Students learn the importance of computational thinking which underpins all computer systems as well as getting an appreciation for computer hardware.

Sprowston Community Academy

Computer Science at Key Stage 3

At Key Stage 3, pupils are placed in mixed-ability classes and receive a one-hour weekly lesson. Our Key Stage 3 curriculum lasts for three years and covers all areas of the National Curriculum. It has been carefully sequenced so that the core topics are revisited yearly, and we use a spiralled curriculum approach so that a deeper knowledge can be developed as topics are revisited each year. The core topics that are covered each year including Computational Thinking, Python Programming, Data Representation, Networking and Computer Systems. In addition, pupils will cover units throughout Key Stage 3, including Physical Computing (using the BBC Micro:Bit), Spreadsheet Modelling, Sound & Video Production, Mobile App Development and Web Development.

Computer Science at Key Stage 4

At Key Stage 4, pupils who opt for Computer Science will follow the OCR J277 Specification and will receive three one-hour lessons per week. The GCSE course is broken down into two core areas that will be assessed through written examinations:

COMP1 covers the theoretical knowledge of Computer Science. Within this, pupils will develop a further understanding of computer systems, software, and internal architecture including memory and storage, as well as how these systems operate using binary. They will also cover network connections and security measures, considering how they are designed, implemented, tested, and maintained. Finally, pupils will investigate the impacts of technology on a range of areas including the environment, society, and cultures around the world.

COMP2 focuses on computational thinking and problem-solving, where pupils will be required to break down and tackle a range of scenarios using algorithmic thinking and programming skills. Pupils will be taught the Python programming language for this component. In addition to the two exams, pupils will be given the opportunity to develop their programming skills and solve a variety of programming challenges. They will also complete a programming project in Year 10; whilst this is not a formal requirement of the course, it is an excellent opportunity for pupils to experience the software development lifecycle and introduces project management, which could be further developed if they choose Computer Science for A-Level.

The Hewett Academy

	Autumn I	Autumn II	Spring I	Spring II	Summer I	Summer II
Year 7	Rotation		Rotation		Online Safety	Computer Systems
Year 8	Rotation		Rotation		Cyber Security	Spreadsheets
Year 9	Rotation		Rotation		Networks	Data Representation
Year 10	Computer data representation + algorithms	Python programming (selection and iteration) + computer memory	Computer hardware design + function programming in Python	Programming with Arrays + software	Networking + programming using validation and error testing	Programming project: Dice Roll project. + Sorting and searching algorithms

CNS

Year 7

- Learn how to solve problems using Small Basic (Aut 1)
- Programming and development in Small Basic (Aut 2)
- Internet Safety (Spring 1 and Spring 2)
- Data and data representation. Communications and networks (Sum 1)
- Hardware and processing. Information technology (Sum 2)

Year 8

- Algorithms and programming development (Aut 1 and Aut 2)
- Internet safety (Spring 1 and Spring 2)
- Data and data representation. Communications and networks (Sum 1)
- Hardware and processing. Information technology (Sum 2)

Yeqr 9

- Algorithms and programming development (Aut 1 and Aut 2)

City Academy

KS3

Computer science at KS3 covers: computational abstraction, key algorithms, block and text based programming, Boolean logic, hardware, software, binary representation, creativity within ICT and Internet safety.

KS4

OCR GCSE Computer Science

Students will be introduced to binary and logic gates. GCSE computer science allows students to develop logic and mathematic skills. Students will gain advanced skills in programming and algorithms. They will complete a computer science project, creating and testing a working program written in Python. Students will study memory, storage and networks. GCSE computer science will develop their understanding of the theory of computer science and how computers work.

• Internet safety (Spring 1 and Spring 2) • Data and data representation. Communications and networks (Sum 1) • Hardware and processing. Information technology (Sum 2)	
Ormiston Victory Academy In Key Stage 3 we follow the National Curriculum for Computing. During Year 7, 8 and 9, students will develop skills relating to both Computer Science and ICT, to prepare them for when they make an informed choice in Key Stage 4. In Year 7, students will study E-Safety through using Internet Searching, PowerPoint, Word and Desktop Publishing in autumn term. In spring term, students will create website using HTML. In Summer, students will study Python Turtle Programming. In Year 8, students will study Spreadsheets and Databases in Autumn Term. From Spring, students will move on to more Computer Science based topics including algorithms, flowcharts and pseudocode. This will prepare them for summer term, where they will learn Basic Python Programming. In Year 9, students will learn a mixture of Computer Science and IT topics, including Spreadsheets, Python Programming, Web Design and Content Creation, Ethical Concerns, User Interfaces, Inside a Computer and Binary.	**Sewell Park Academy** **Year 7** • Introduction into Computer Science (Aut 1) • Creating art (Aut 2) • How the computer works (Spring 1) • The Web (Spring 2) • The Quiz and The Project (Sum 1/2) **Year 8** • The binary system and operating systems (Aut 1) • Instruction set design (Aut 2) • Programming (Spring 1) • Sorting (Spring 2) • Smart computers (Sum 1) • Recursive patterns (Sum 2) **Year 9** • Introduction to word processing (Aut 1) • Introduction to spreadsheets (Aut 2)

Hellesdon High School

Year 7

	Topic(s)
Autumn Term	Smart Computing Skills Graphics
Spring Term	The School Production Computational Thinking
Summer Term	Virtual Pet Harry Plotter

Year 8

	Topic(s)
Autumn Term	Music App in Scratch Information Validity and Bias
Spring Term	Animated Me Petcare Interactive Site
Summer Term	Programming with Python Crime-Scene Database

Year 9

	Topic(s)
Autumn Term	HHS World Theme-park Computer Systems
Spring Term	My Logo This Website is Mine
Summer Term	ASCII Spies Choose Your Own Adventure

Notre Dame High School

Year 7

- Using Computers, Safely, Effectively and Responsibly – eSafety and savvy computer use
- Control systems with Flowol - Solving problems with flowcharts
- Understanding computers - Discover how computers work
- Games programming in Scratch - Design and program a live web game
- First steps in Small Basic - Introductory programming skills

Year 8

- Computer crime and cyber security - Hacking, data protecting and the law
- Database development - Build and interrogate your own software system
- Introduction to Python - Learn to program with confidence
- Spreadsheet modelling - Develop and test a new business model
- Modelling in Small Basic - Model sales for a lemonade stand

Year 9

- Graphics - Discover bitmap and vector graphics
- Creating a video - Script, film and edit an advertisement
- HTML and website Development - Design and code a modern website
- Python Turtle – Improve confidence in programming, use graphics in a High-Level Language
- Networks - Explore how data travels the world

Thorpe St Andrew School

Year 7

- Introduction to the network, Research and presentation of information, Data representation – images, Computational thinking, Photoshop skills, Programming

Year 8

- Programming, Data representation – sound, Data systems, App creation, Computer systems, Computational thinking

Year 9

- Programming, Digital presentation quiz, Desktop publishing, HTML, Cyber security, Networking and physical computing