

CITY OF
ROCHESTER



SCHOOL

City of Rochester School Computing Curriculum

Computing Curriculum

Key Stage 1 – 4

Intent

- At City of Rochester school, we believe that computing is an essential part of the curriculum; a subject that not only stands alone but is woven and should be an integral part of all learning.
- Computing, in general, is a significant part of everyone's daily life and children should be at the forefront of new technology, with a thirst for learning what is out there. Computing within schools can therefore provide a wealth of learning opportunities and transferrable skills explicitly within the Computing lesson and across other curriculum subjects.
- Through the study of Computing, children will be able to develop a wide range of fundamental skills, knowledge and understanding that will actually equip them for the rest of their life. Computers and technology are such a part of everyday life that our children would be at a disadvantage were they not be exposed to a thorough and robust Computing curriculum.
- The Board of Trustees which comprises experts in SEN and in particular ASD, have been actively involved in curriculum design. This means that the curriculum is fit for purpose for children with special educational needs. A large part of the curriculum is experiential as it is important for children on the autism spectrum to be able to make cohesive links that are not abstract. A fully immersive experience is required. Examples include through World Book Day, author and poet visits and a range of trips and visits which enrich and complement children's learning.

Implementation

- Computing is taught using a blocked curriculum approach as well as through cross curricular links to Learning Means the World. This ensures children are able to develop depth in their knowledge and skills over the duration of each of their computing topics.
- Teachers use units from Purple Mash as a starting point for the planning of their computing lessons, which are often richly linked to engaging contexts in other subjects and topics.
- Each student is allocated their own laptop and have access to ten ipads to ensure that all year groups have the opportunity to use a range of devices and programs for many purposes across the wider curriculum, as well as in discrete computing lessons. Employing cross-curricular links motivates pupils and supports them to make connections and remember the steps they have been taught.
- The implementation of the curriculum also ensures a balanced coverage of computer science, information technology and digital literacy. The children will have experiences of all three strands in each year group, but the subject knowledge imparted becomes increasingly specific and in depth, with more complex skills being taught, thus ensuring that learning is built upon.
- Staff have access to a bespoke and whole school training programme which enables them to meet the individual needs of pupils in relation to their diagnosis of ASD and other co-morbidities together with subject specific/curriculum training. Examples include: Understanding Autism, how the developing brain works, visits to other schools to observe and learn from best practice, subject specific training, memberships and participation in subject associations, participating in curriculum meetings, access to on-line resources – for example Optimus Education.
- Quality Assurance activities include: learning walks, formal and informal lesson observations, including peer to peer observations, pupil surveys and curriculum team meetings.

Impact

- Through the implementation of the curriculum pupils will be digitally literate and able to join the rest of the world on its digital platform. They will be equipped, not only with the skills and knowledge to use technology effectively and for their own benefit, but more importantly – safely.
- The biggest impact we want on our children is that they understand the consequences of using the internet and that they are also aware of how to keep themselves safe online.
- As children become more confident in their abilities in Computing, they will become more independent and key life skills such as problem-solving, logical thinking and self-evaluation become second nature.
- Attainment is measured using SIMs and is designed for continuous use. Teachers record the small steps pupils make and use these steps to build a bigger picture of the pupils' learning and achievements.
- Regular feedback is sought from pupils through the School Council (half-termly), pupil surveys, (termly), parent surveys (annually), staff surveys (annually)
- Confidence, Resilience and Success are core values at City of Rochester School. This means that the acquisition of social skills and personal development are of paramount importance to our pupils to life beyond school. Impact is therefore demonstrated through social and linguistic development which the school evidences through case studies.
- Pupils have significant barriers to learning which the school works hard to help pupils overcome. This means that the school works with a wide variety of partners such as medical professionals, curriculum partners, parents/carers, education professionals and the wider community to promote pupil's engagement in learning.

Statutory Guidance – Computing

The national curriculum for computing aims to ensure that all pupils:

- 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

Links To Other Subjects

As a school we are all aware that IT and computing skills should be developed through all subjects.

Where appropriate, IT and computing should be incorporated into schemes of work for all subjects. IT and computing should be used to support learning in other subjects as well as developing computing knowledge, skills and understanding.

This subject links to careers education through discussion, information sharing and practical activities and experiences. These opportunities can lead to a better understanding of the further study options, training and work placements available in this field.

Careers Links:

Learning in this subject may lead to possible careers in the following areas:

- 3D printing technician – you can make different products, such as medical implants, car parts, aircraft parts or fashion accessories.
- App developer – you can design and build mobile applications for PCs, mobile phones and tablets.
- Archivist – you could look after and preserve collections of historical records and documents.
- Cyber intelligence officer – you could be gathering information about where threats to information technology (IT) systems come from and how they work.
- Librarian - you run public and private libraries, managing access to books, multi-media resources and computers.

Links are also made to our experiential curriculum – in particular Film School and Programming School.

Curriculum Overview

- * Our curriculum is designed with our children in mind but is subject to change. Units may be moved around to suit children’s interests, current affairs and to make better use of resources. If this happens staff ensure that there is breadth and balance across the year to ensure coverage.

KS1

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 1	Online Safety & Exploring Purple Mash Grouping & Sorting	Pictograms Lego Builders	Maze Explorers Animated Story books	Animated Story Books Coding	Coding	Spreadsheets Technology outside school
Year 2	Coding	Online Safety Spreadsheets	Questioning	Effective Searching Creating Pictures	Creating Pictures Making Music	Presenting Ideas

KS2

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 3	Unit 3.1 Coding	Unit 3.2 Online Safety Unit 3.3 Spreadsheets	Unit 3.4 Touch-Typing	Unit 3.5 Email (including email safety)	Unit 3.6 Branching Databases	Unit 3.7 Simulations Unit 3.8 Graphing
Year 4	Unit 4.1 Coding Unit 4.2 Online Safety	Unit 4.3 Spreadsheets	Unit 4.4 Writing for Different Audiences	Unit 4.5 Logo	Unit 4.6 Animation	Unit 4.7 Effective Searching Unit 4.8 Hardware Investigators
Year 5	Unit 5.1 Coding	Unit 5.2 Online Safety	Unit 5.3 Spreadsheets	Unit 5.4 Databases	Unit 5.5 Game Creator	Unit 5.6 3D Modelling Unit 5.7 Concept Maps
Year 6	Unit 6.1 Coding	Unit 6.2 Online Safety	Unit 6.3 Spreadsheets	Unit 6.4 Blogging	Unit 6.5 Text Adventures	Unit 6.6 Networks Unit 6.7 Quizzing

KS3

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 7	Networking - e-safety, using computers and the internet	Computers – Inputs/Outputs and Memory	Representing Data - Excel	Graphic Design	Computational Thinking – Algorithms and decomposition	Programming Basic Programming Techniques (Scratch)
Year 8	Computational Thinking – Turtle Programming and Algorithms	Networking – Networking basics	Data representation – How data is represented in computers	Programming – Text based Game	Computers – Software and Hardware	It – Using technology safely
Year 9	Computational Thinking - Programming algorithms	Programming - Further programming techniques in python	Computers - Introduction to Linux (Self-Led)	IT - Artificial Intelligence (Self-Led)	Networking - Cryptography (Self-Led)	Data Representation - Boolean Logic and Processing

KS4

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 10	Using ICT	Finding and selecting information	Working with numbers, data and charts	Working with text and images	Combining and presenting information	Using ICT to communicate
Year 11	Using ICT	Finding and selecting information	Working with numbers, data and charts	Working with text and images	Combining and presenting information	Using ICT to communicate

Detailed Curriculum Map

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 1	Online Safety & Exploring Purple Mash Grouping & Sorting	Pictograms Lego Builders	Maze Explorers Animated Story books	Animated Story Books Coding	Coding	Spreadsheets Technology outside school
Learning Objectives Covered	<ul style="list-style-type: none"> To log in safely and understand why that is important. To create an avatar and to understand what this is and how it is used. To be able to create a picture and add their own name to it. To start to understand the idea of 'ownership' of creative work. To save work to the My Work area and understand that this is private space. To learn how to find saved work in the Online Work area. To learn about what the teacher has access to in Purple Mash. To learn how to see messages left by the teacher on their work. To learn how to search Purple Mash to find resources To become familiar with the types of resources available in the Topics section. To become more familiar with the icons used in the resources in the Topics section. To start to add pictures and text to work. 	<ul style="list-style-type: none"> To understand that data can be represented in picture format To contribute to a class pictogram To use a pictogram to record the results of an experiment To emphasise the importance of following instructions To follow and create simple instructions on the computer To consider how the order of instructions affects the result 	<ul style="list-style-type: none"> To understand the functionality of the basic direction keys in Challenges 1 and 2. To be able to use the direction keys to complete the challenges successfully. To understand the functionality of the basic direction keys in Challenges 3 and 4. To understand how to create and debug a set of instructions (algorithm). To use the additional direction keys as part of their algorithm. To understand how to change and extend the algorithm list. To understand the differences between traditional books and e-books. To explore the tools of 2Create a Story's My Simple Story level. To save the page they have created. To add animation to a picture. To play the pages created so far. To save the additional changes and overwrite the file. 	<ul style="list-style-type: none"> To add a sound effect to a picture. To add a voice recording to the picture. To add created music to the picture. To add a background to the story. To demonstrate a good understanding of all the tools they have used in 2Create a Story and use these successfully to create their own story. To use the copy and paste feature to create additional pages. To continue and complete an animated story. To create a class display board of the story books created by the class. To understand what instructions are. To predict what will happen when instructions are followed. To understand that computer programs work by following instructions called code. 	<ul style="list-style-type: none"> To understand what an event is. To use an event to control an object. To understand what an event is. To begin to understand how code executes when a program is run. To understand what backgrounds and objects are. To understand how to use the scale property. To plan a computer program. To make a computer program. 	<ul style="list-style-type: none"> To understand what a spreadsheet looks like. To be able to navigate around a spread sheet and enter data. To learn new vocabulary related to spreadsheets. To add clipart images to a spreadsheet. To use the 'move cell' and 'lock' tools. To use the 'speak' and 'count' tools in 2Calculate to count items. To find and understand examples of where technology is used in the local community To record examples of technology outside school.

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 2	Unit 2.1 Coding	Unit 2.2 Online Safety Unit 2.3 Spreadsheets	Unit 2.4 Questioning	Unit 2.5 Effective Searching	Unit 2.6 Creating Pictures	Unit 2.7 Making Music Unit 2.8 Presenting Ideas
Learning Objectives Covered	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Use technology purposefully to create, organise, store, manipulate and retrieve digital content 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. 	<ul style="list-style-type: none"> Use technology purposefully to create, organise, store, manipulate and retrieve digital content 	<ul style="list-style-type: none"> Use technology purposefully to create, organise, store, manipulate and retrieve digital content Recognise common uses of information technology beyond school 	<ul style="list-style-type: none"> Use technology purposefully to create, organise, store, manipulate and retrieve digital content 	<ul style="list-style-type: none"> Use technology purposefully to create, organise, store, manipulate and retrieve digital content

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 3	Unit 3.1 Coding	Unit 3.2 Online Safety Unit 3.3 Spreadsheets	Unit 3.4 Touch-Typing	Unit 3.5 Email (including email safety)	Unit 3.6 Branching Databases	Unit 3.7 Simulations Unit 3.8 Graphing
Learning Objectives Covered	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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.

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 4	Unit 4.1 Coding Unit 4.2 Online Safety	Unit 4.3 Spreadsheets	Unit 4.4 Writing for Different Audiences	Unit 4.5 Logo	Unit 4.6 Animation	Unit 4.7 Effective Searching Unit 4.8 Hardware Investigators
Learning Objectives Covered	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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 technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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.

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 5	Unit 5.1 Coding	Unit 5.2 Online Safety	Unit 5.3 Spreadsheets	Unit 5.4 Databases	Unit 5.5 Game Creator	Unit 5.6 3D Modelling Unit 5.7 Concept Maps
Learning Objectives Covered	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. 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. 	<ul style="list-style-type: none"> 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.

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 6	Unit 6.1 Coding	Unit 6.2 Online Safety	Unit 6.3 Spreadsheets	Unit 6.4 Blogging	Unit 6.5 Text Adventures	Unit 6.6 Networks Unit 6.7 Quizzing
Learning Objectives Covered	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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.

	presenting data and information.					
	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 7	Networking - e-safety, using computers and the internet	Computers – Inputs/Outputs and Memory	Representing Data - Excel	Graphic Design	Computational Thinking – Algorithms and decomposition	Programming Basic Programming Techniques (Scratch)
Learning Objectives Covered	<p>4. Summarises the difference between the internet and internet service e.g. world wide web. Shows an awareness of, and can use a range of internet services e.g. VOIP.</p> <p>3. Understands the importance of communicating safely and respectfully online, and the need for keeping personal information private. Understands how to effectively use search engines. Understands why computers are connected in a network.</p> <p>2. Navigates the web and can carry out simple web searches to collect digital content. Explains the difference between a web browser and a search engine.</p> <p>1. Obtains content from the world wide web using a web browser. Knows what to do</p>	<p>4. Classifies a range of software including operating systems, utility and application software. Explains the difference between hardware and software, and their roles within a computer system.</p> <p>3. Gives examples of how data is stored on a computer. Explains the function of the main internal parts of basic computer architecture.</p> <p>2. Outlines the concepts behind the input-process-output cycle. Recognises that a range of digital devices can be considered a computer.</p> <p>1. Recognises and can use a range of input and output devices. Recognises that all software executed on digital devices is programmed.</p>	<p>4. Illustrates how digital computers use binary to represent all data. Summarises the relationship between data representation and data quality.</p> <p>3. Classifies different types of data (text, number) and understands how these are used in different situations. Demonstrates how filters or single criteria searches can find information.</p> <p>2. Understands the difference between data and information. Knows why sorting data in a flat file can improve searching for information.</p> <p>1. Recognises that digital content can be represented in many forms. Distinguishes between some of these forms and can explain the different ways that they communicate information. Recognises</p>	<p>4. Uses a variety of software to manipulate and present digital content: data and information. Creates digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience</p> <p>3. Shows an awareness for the quality of digital content collected. Shares their experiences of technology in school and beyond the classroom. Talks about their work and makes improvements to solutions based on feedback received.</p> <p>2. Demonstrates how to store and edit digital content using appropriate file and folder names.</p> <p>1. Demonstrates use of computers safely and responsibly, knowing a range of ways to report unacceptable content and contact when</p>	<p>4. Constructs solutions (algorithms) that use repetition and two-way selection. Solves problems through decomposition.</p> <p>3. Demonstrate simple algorithms using loops, and selection. Detects and corrects errors i.e. debugging, in algorithms.</p> <p>2. Understands that computers need precise instructions. Demonstrates care and precision to avoid errors.</p> <p>1. Defines what an algorithm is. Reproduces/ Follows algorithms step-by-step.</p>	<p>4. Uses logical reasoning to predict the behaviour of programs. Builds programs that implement algorithms to achieve given goals.</p> <p>3. Demonstrates how arithmetic operators, if statements, and loops, are used within programs. Declares and assigns variables.</p> <p>2. Knows that users can develop their own programs, and can demonstrate this by creating a simple program in an environment that does not rely on text. Detects and corrects simple semantic errors i.e. debugging, in programs.</p> <p>1. Observes that programs execute by following precise instructions. Executes,</p>

	when concerned about content or being contacted.		that data can be structured in tables to make it useful.	online. Understands the legal frameworks governing the use of information.		checks and changes programs.
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	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 8	Computational Thinking - Programming algorithms	Programming - Further programming techniques in python	Computers - Introduction to Linux (Self-Led)	IT - Artificial Intelligence (Self-Led)	Networking - Cryptography (Self-Led)	Data Representation - Boolean Logic and Processing
Learning Objectives Covered	<p>4. Finds where information can be filtered out in generalising problem solutions (abstraction).</p> <p>3. Uses logical reasoning to predict outputs, showing an awareness of inputs. Selects similarities and differences in situations and uses these to solve problems (pattern recognition).</p> <p>2. Constructs solutions (algorithms) that use repetition and two-way selection. Solves problems through decomposition.</p> <p>1. Demonstrates simple algorithms using loops, and selection. Detects and corrects errors i.e. debugging, in algorithms.</p>	<p>4. Examines the importance of network security including simple security techniques such as strong passwords</p> <p>3. Demonstrates data transmission between digital computers over networks, including the internet i.e. IP addresses and packet switching. Constructs static web pages using HTML.</p> <p>2. Summarises the difference between the internet and internet service e.g. world wide web. Shows an awareness of, and can use a range of internet services e.g. VOIP.</p> <p>1. Understands the importance of communicating safely and respectfully online, and the need for keeping personal information private. Understands how to effectively use search engines. Explains the difference between a web browser and a search engine.</p>	<p>4. Examines how processors' instruction sets relate to low-level instructions carried out by a computer.</p> <p>3. Illustrate how bit patterns represent numbers, images and sound.</p> <p>2. Illustrates how digital computers use binary to represent all data. Summarises the relationship between data representation and data quality.</p> <p>1. Classifies different types of data (text, number) and understands how these are used in different situations. Demonstrates how filters or single criteria searches can find information.</p>	<p>4. Designs, writes and debugs modular programs using functions. Selects appropriate variables and relational operators within a loop to govern termination. Establishes the difference between a while loop and a for loop.</p> <p>3. Identifies the differences between, and appropriately uses if and if, then and else statements. Has practical experience of a high-level textual language,</p> <p>2. Uses logical reasoning to predict the behaviour of programs. Builds programs that implement algorithms to achieve given goals.</p> <p>1. Demonstrates how arithmetic operators, if statements, and loops, are used within programs. Declares and assigns variables.</p>	<p>4. Investigates the differences between different Operating Systems, and the advantages and disadvantages of these.</p> <p>3. Uses a range of application software to carry out designated tasks.</p> <p>2. Classifies a range of software including operating systems, utility and application software.</p> <p>1. Explains the difference between hardware and software, and their roles within a computer system. Gives examples of how data is stored on a computer.</p>	<p>4. Makes judgements about digital content when evaluating and repurposing it for a given audience. Recognises the audience when designing and creating digital content.</p> <p>3. Undertakes creative projects that collect, analyse, and evaluate data to meet the needs of a known user group. Effectively designs and creates digital artefacts for a wider or remote audience.</p> <p>2. Uses a variety of software to manipulate and present digital content: data and information. Creates digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience</p> <p>1. Shows an awareness for the quality of digital content collected. Shares their experiences of technology in school and beyond the classroom. Talks about their work and makes improvements to solutions based on feedback received.</p>

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 9	Computational Thinking - Programming algorithms	Programming - Further programming techniques in python	Computers - Introduction to Linux (Self-Led)	IT - Artificial Intelligence (Self-Led)	Networking - Cryptography (Self-Led)	Data Representation - Boolean Logic and Processing
Learning Objectives Covered	<p>4. Evaluates the effectiveness of algorithms and models for similar problems.</p> <p>3. Develops solutions to complex problems independently.</p> <p>2. Finds where information can be filtered out in generalising problem solutions (abstraction).</p> <p>1. Uses logical reasoning to predict outputs, showing an awareness of inputs. Selects similarities and differences in situations and uses these to solve problems (pattern recognition).</p>	<p>4. Tests solutions thoroughly to determine the effectiveness of the solution. Appreciates the effect of the scope of a variable.</p> <p>3. Uses a range of operators and expressions e.g. Boolean, and applies them in the context of program control. Understands and applies parameter passing. Understands and uses two dimensional data structures.</p> <p>2. Designs, writes and debugs modular programs using functions. Selects appropriate variables and relational operators within a loop to govern termination. Establishes the difference between a while loop and a for loop.</p> <p>1. Identifies the differences between, and appropriately uses if and if, then and else statements. Has practical experience of a high-level textual language.</p>	<p>4. Choose an appropriate combination of commands to control a computer system effectively using just a command line.</p> <p>3. Uses the command line to model tasks commonly completed with the use of a GUI. Develop understanding of how Operating Systems manage files.</p> <p>2. Investigates the differences between different Operating Systems, and the advantages and disadvantages of these.</p> <p>1. Uses a range of application software to carry out designated tasks.</p>	<p>4. Debates ethical issues surrounding the application of information technology beyond school. Evaluates and explains how the use of technology can impact on society.</p> <p>3. Uses criteria to evaluate the quality of solutions, can identify improvements making some refinements to the solution, and future solutions.</p> <p>2. Makes judgements about digital content when evaluating and repurposing it for a given audience. Recognises the audience when designing and creating digital content.</p> <p>1. Undertakes creative projects that collect, analyse, and evaluate data to meet the needs of a known user group. Effectively designs and creates digital artefacts for a wider or remote audience.</p>	<p>4. Debates the ethical and moral implications on cryptography from a personal, national and world-wide standpoint.</p> <p>3. Builds models to demonstrate how cryptography is used for encrypting and decrypting data. Experiments with some common network security methods, including public key encryption.</p> <p>2. Examines the importance of network security including simple security techniques such as strong passwords.</p> <p>1. Demonstrates data transmission between digital computers over networks, including the internet i.e. IP addresses and packet switching. Constructs static web pages using HTML. Manipulate simple encryption techniques.</p>	<p>4. Considers the advances in technology and how these have an impact on the power of computers. Analyses and evaluates data and information, and recognises that poor quality data leads to unreliable results, and inaccurate conclusions.</p> <p>3. Models the relationship between binary and electrical circuits, including Boolean logic through the use of logic tables.</p> <p>2. Examines how processors' instruction sets relate to low-level instructions carried out by a computer.</p> <p>1. Illustrate how bit patterns represent numbers, images and sound.</p>

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 10	Using ICT	Finding and selecting information	Working with numbers, data and charts	Working with text and images	Combining and presenting information	Using ICT to communicate
Learning Objectives Covered	<ul style="list-style-type: none"> develop their capability, creativity and knowledge in computer science, digital media and information technology develop and apply their analytic, problem-solving, design, and computational thinking skills understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns. 	<ul style="list-style-type: none"> develop their capability, creativity and knowledge in computer science, digital media and information technology develop and apply their analytic, problem-solving, design, and computational thinking skills understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns. 	<ul style="list-style-type: none"> develop their capability, creativity and knowledge in computer science, digital media and information technology develop and apply their analytic, problem-solving, design, and computational thinking skills understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns. 	<ul style="list-style-type: none"> develop their capability, creativity and knowledge in computer science, digital media and information technology develop and apply their analytic, problem-solving, design, and computational thinking skills understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns. 	<ul style="list-style-type: none"> develop their capability, creativity and knowledge in computer science, digital media and information technology develop and apply their analytic, problem-solving, design, and computational thinking skills understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns. 	<ul style="list-style-type: none"> develop their capability, creativity and knowledge in computer science, digital media and information technology develop and apply their analytic, problem-solving, design, and computational thinking skills understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns.

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
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Year 11	Using ICT	Finding and selecting information	Working with numbers, data and charts	Working with text and images	Combining and presenting information	Using ICT to communicate
Learning Objectives Covered	<ul style="list-style-type: none"> develop their capability, creativity and knowledge in computer science, digital media and information technology develop and apply their analytic, problem-solving, design, and computational thinking skills understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns. 	<ul style="list-style-type: none"> develop their capability, creativity and knowledge in computer science, digital media and information technology develop and apply their analytic, problem-solving, design, and computational thinking skills understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns. 	<ul style="list-style-type: none"> develop their capability, creativity and knowledge in computer science, digital media and information technology develop and apply their analytic, problem-solving, design, and computational thinking skills understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns. 	<ul style="list-style-type: none"> develop their capability, creativity and knowledge in computer science, digital media and information technology develop and apply their analytic, problem-solving, design, and computational thinking skills understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns. 	<ul style="list-style-type: none"> develop their capability, creativity and knowledge in computer science, digital media and information technology develop and apply their analytic, problem-solving, design, and computational thinking skills understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns. 	<ul style="list-style-type: none"> develop their capability, creativity and knowledge in computer science, digital media and information technology develop and apply their analytic, problem-solving, design, and computational thinking skills understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to identify and report a range of concerns.