



CURRICULUM PLAN

COMPUTING

BRAMHALL HIGH SCHOOL

Curriculum Intent

YEAR 7

- Students look at the impact of technology and the dangers of online behaviours such as Cyberbullying
- Students learn how to construct a spreadsheet model and use a variety of formulas to produce information
- Students use a visual based programming tool called Scratch to build their coding and logical skills
- Students learn about networks and protocols and how hardware and software is used in computing
- Students learn about the reliability of online research and produce digital artefacts based on this research
- Students learn more advanced techniques on the Scratch program covering sequencing, operators and iteration

YEAR 8

- Students learn about how algorithms are used in everyday life and how logical sequencing, selection and iteration are vital to modern programming
- Students are introduced to a text based programming language called Python and carry out some tasks and evaluate these
- Students learn the different layers of computing systems including programs, the operating system, the physical components that store and execute these programs and the binary building blocks that these components consist of
- Students learn about the complex technology built in to the modern mobile phone and how each component works and what it's function is
- Students learn about representations and how binary numbers are used to represent different text and images
- Students learn how a graphical design package called Inkscape can be used to create sophisticated digital representations of images

YEAR 9

- Students learn more complex text based programming using Python than covered in year 8 adding more variables and individual responses
- Students learn about the Importance of cyber security, hacking, viruses and social engineering
- Students look at representations and how audio and visual Information can be used together
- Students learn about the development of mobile phone apps and how they are designed to meet different needs of Individuals
- Students learn and discover how professionals create 3D animations using the industry-standard software package, Blender
- Students learn how a graphical design package called Inkscape can be used to create sophisticated digital representations of images*

* this unit will be moved to year 8 In 24/25 permanently to be replaced by a HTML web design unit

YEAR 10

Year 10 focuses on Paper 2 of the GCSE – Computational Thinking and Algorithms. This paper focuses on topics that were traditionally taught at college level but not at GCSE – bridging the gap for pupils so they are better prepared for programming in either college or an apprenticeship. Topics included are; Algorithms, Iteration, Boolean, Data Types, Searching and Sorting Algorithms, Input and Output, Problem Solving, Binary and Hex, Programming Languages. Many of these topics have been looked at in Year 7 and 8 which means they can be focused on in more depth.

YEAR 11

Year 11 focuses on Paper 1 of the GCSE – Computer Systems. This focuses on topics that are more traditionally taught at GCSE within the old specification but in more depth, again preparing pupils for college and beyond. Topics in this unit are; Hardware, Software, Networks, Security and Ethical, Legal, Cultural and Environmental concerns. Many of these topics have been looked at in Year 7 and 8 which means they can be focused on in more depth.

Academic Year: 2023-2024

Review Date: September 2024

Author: Mr C Kendrew – Head of Computing

YEAR 7

| Term | Programme of Learning | Links to the National Curriculum / Specification / Additional | Assessments | What extra learning opportunities are planned? | Disciplinary Literacy |
|----------------|--|---|-----------------------------|---|--------------------------------|
| Term 1a | Impact of Technology 1. Introduction and email 2. Room rules 3. Respectful communication 4. <i>English Star Reader Tests</i> 5-6. Cyberbullying presentations 7. Impersonation online | <p>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</p> <p>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.</p> | Cyberbullying Presentations | Students are shown how to access their files from home and to move files from home to school and vice versa | Cyberbullying Collaborating |

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| <p>Term 1b</p> | <p>Spreadsheets 1. Getting to know a spreadsheet 2. Quick Calculations 3. Collecting Data 4. Data Master 5. Level up data skills 6. Assessment of final model</p> | <p>design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems</p> | <p>Spreadsheet model</p> | <p>Students are encouraged to look critically at local shops that sell confectionary and base their models on these</p> | <p>Modelling Formatting</p> |
| <p>Term 2a</p> | <p>Scratch – an Introduction to coding 1. Scratch Introduction Videos 2. Game Basics 3. Underwater Game 4. Monkey Game 5. Creating graphics 6. Sub-routines and variables EXTENSION: Microbits</p> | <p>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 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</p> | <p>Scratch Assessment 1</p> | <p>Students are encouraged to download Scratch at home and practise using it</p> | <p>Animate Logic</p> |

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| Term 2b | Networks 1 Networks and protocols 2. Hardware 3. Wireless networks 4. Internet 5. internet services 6. world wide web | understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems | Summative Assessment | | Protocol Network |
| Term 3a | Zoo Project 1. Internet Research Reliability of sources 2. and 3. Factsheet 4. and 5 Logo creation (vector graphics intro) 6. Evaluation 7. <i>English Star Tests</i> | 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 | Factsheet | Students are asked to research successful logos | Reliability Alignment |

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| <p>Term 3b</p> | <p>Scratch Programming and Sequencing</p> <ol style="list-style-type: none"> 1. Sequencing intro 2. Sequencing and Variables 3. Selection 4. Operators 5. Count-controlled iteration 6. Problem Solving | <p>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</p> <p>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</p> | <p>Scratch Assessment 2</p> | <p>Students are encouraged to download Scratch at home and develop their skills</p> | <p>Sequence Variables</p> |
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YEAR 8

| Term | Programme of Learning | Links to the National Curriculum / Specification / Additional | Assessments | What extra learning opportunities are planned? | Disciplinary Literacy |
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| Term 1a | <p>Algorithms explain what an algorithm is and create algorithms to solve specific problems</p> <ul style="list-style-type: none"> • use sequence, selection and iteration in algorithms • use input, processing and output in algorithms • express algorithms using flow diagrams and pseudocode • analyse, assess and compare different algorithms • create, name and use suitable variables • use arithmetic, relational and Boolean operators <ul style="list-style-type: none"> • use conditional statements. | <p>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</p> <p>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]</p> | Booklets completed and assessed using CPR | Students to consider how everyday tasks can be broken down into various steps | Algorithm Iteration |

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| Term 1b | Introduction to Python (RPi) Basic Python theory booklets CPR | <p>design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems</p> <p>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</p> <p>use 2 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</p> <p>understand simple Boolean logic [for example, AND, OR</p> | Quality of theory booklet and level of understanding shown CPR | Download REPL at home and work on Python | Syntax Input |
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| | | 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] | | | |
| Term 2a | Computer Systems 1. get in gear 2. under the hood 3. orchestra conductor 4. its only logical 5. thinking machines 6. sharing | <p>This unit takes learners on a tour through the different layers of computing systems: from programs and the operating system, to the physical components that store and execute these programs, to the fundamental binary building blocks that these components consist of.</p> <p>The aim is to provide a concise overview of how computing systems operate, conveying the essentials and abstracting away the technical details that might confuse or put off learners.</p> | Unit Assessment | | Software Hardware |

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| | | The last lessons cover two interesting contemporary topics: artificial intelligence and open source software. These are linked back to the content of the unit, helping learners to both broaden their knowledge and focus on the topics addressed in the unit. | | | |
| Term 2b | Mobile Technology <ol style="list-style-type: none"> 1. Mobile Phone comparison 2. Function 3. Apps 4. User requirements 5. Coverage 6. Data Transfer | 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 | Booklets assessed for quality and depth of answers CPR | Students to research various phone options using both Android and IOS | Processor Megapixels |

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| <p>Term 3a</p> | <p>Representations – from clay to silicon</p> <ol style="list-style-type: none"> 1. Across time and Space 2. Lights and drums 3. Binary digits 4. Numbers in binary 5. Large quantities 6. Turing’s mug | <p>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]</p> <p>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</p> | <p>Summative Assessment</p> <p>Year 8 examination</p> | | <p>Binary Representations</p> |
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| <p>Term 3b</p> | <p>Extended Vector Graphics – Inkscape</p> <ol style="list-style-type: none"> 1. Basic introduction 2. Sonic the Hedgehog 3. The Apple 4. Bitmap trace 5. Reproducing well known face | <p>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</p> | <p>Final Portfolio</p> | <p>Students are given the opportunity to choose from a huge variety of web images and recreate digital versions of these. They are encouraged to download Inkscape at home to practise their skills</p> | <p>Node Duplicate</p> |
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YEAR 9

| Term | Programme of Learning | Links to the National Curriculum / Specification / Additional | Assessments | What extra learning opportunities are planned? | Disciplinary Literacy |
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| Term 1a | SIRI Project Advanced Python coding | <ul style="list-style-type: none"> design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems use 2 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 understand simple Boolean logic [for | Presentations completed and assessed using CPR | Using python at home on their REPL accounts | Appropriate Meaningful |

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| | | <p>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]</p> | | | |
| Term 1b | <p>Cyber Security</p> <ol style="list-style-type: none"> 1. You and your data 2. Social Engineering 3. Script Kiddies 4. Rise of the bots 5. There's no place like 127.0.0.1 6. Under Attack | <p>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.</p> | <p>Summative Assessment</p> <p>Year 9 examination</p> | <p>Students are asked to look at major events in the world of cyber security</p> | <p>Malware</p> <p>Social Engineering</p> |

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| <p>Term 2a</p> | <p>Representations – going audio visual? 1. Binary mosaic 2. Splash of colour 3. Collage 4. Good vibrations 5. Sonic playground 6. Always another way</p> | <p>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</p> | <p>Summative Assessment</p> | <p>Students are encouraged to look at existing visual presentations</p> | <p>Pixels Resolution</p> |
| <p>Term 2b</p> | <p>Mobile App development 1. App for that 2. Tappy tap app 3. School lab studios 4. User Input 5. App development 6. Project completion</p> | <p>design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems</p> <p>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</p> | <p>Summative Assessment</p> | <p>Students to consider which apps they currently use, which ones they no longer use</p> | <p>Paradigm Decomposition</p> |

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| <p>Term 3a</p> | <p>Media Animations?</p> <ol style="list-style-type: none"> 1. Move, rotate, scale, colour 2. Animation, names, parenting 3. Complex models and colours 4. Organic Modelling 5. Lights, camera, render 6. Project | <p>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</p> | | | <p>Animation Subdivision</p> |
| <p>Term 3b</p> | <p>Extended Vector Graphics – Inkscape</p> <ol style="list-style-type: none"> 1. Basic introduction 2. Sonic the Hedgehog 3. The Apple 4. Bitmap trace 5. Reproducing well known face | <p>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</p> | <p>Final Portfolio</p> | <p>Students are given the opportunity to choose from a huge variety of web images and recreate digital versions of these. They are encouraged to download Inkscape at home to practise their skills</p> | <p>Node Duplicate</p> |

YEAR 10

| Term | Programme of Learning | Links to the National Curriculum / Specification / Additional | Assessments | What extra learning opportunities are planned? | Disciplinary Literacy |
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| Initial Assessment | 30 Programming Challenges set by OCR | 3 weeks to attempt to complete as many of the programming challenges as possible. This is a great way for pupils to refresh their programming knowledge. | Portfolio of work | Pupils will have the opportunity to complete these challenges in their own time as homework tasks | |
| Paper 2: Topic 9 | Algorithms | <p>Explain what is meant by computational thinking [Syllabus reference 2.1.1]</p> <p>Explain what is meant by decomposition, abstraction and algorithmic thinking and use them to solve problems [Syllabus reference 2.1.1]</p> <p>Create algorithms to solve problems that you have analysed [Syllabus reference 2.1.2]</p> <p>Identify the inputs, processes and outputs for a problem [Syllabus reference 2.1.2]</p> | Algorithm practical assessment | Interactive challenges within unit | <ul style="list-style-type: none"> • Algorithm • Computational thinking • Decomposition • Abstraction • Sequence • Selection • Iteration • Flowchart • Variable • Constant |

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| | | Create, interpret, correct, complete and modify algorithms using flowcharts [Syllabus reference 2.1.2] | | | |
| Paper 2: Topic 10 | Programming Fundamentals | <ul style="list-style-type: none"> • express algorithms using pseudocode [Syllabus reference 2.1.2] • create, name and use suitable variables [Syllabus reference 2.2.1] • use arithmetic, relational and Boolean operators [Syllabus reference 2.2.1] • use conditional statements [Syllabus reference 2.2.1] • explain what is meant by iteration [Syllabus reference 2.2.1] • explain the difference between definite and indefinite iteration • use for loops [Syllabus reference 2.2.1] • use while loops [Syllabus reference 2.2.1] • use do ... until loops [Syllabus reference 2.2.1] | Practical Coding Task | <p>Interactive challenges within unit</p> <p>Coding opportunities</p> | <ul style="list-style-type: none"> • <i>Definite iteration</i> • <i>Indefinite iteration</i> • <i>For loop</i> • <i>While loop</i> • <i>Do...until loop</i> • <i>Nested loop</i> • <i>Infinite loops</i> • <i>Trace table</i> |

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| | | <ul style="list-style-type: none"> • use nested loops [Syllabus reference 2.2.1] • analyse algorithms using trace tables to identify common errors [Syllabus reference 2.2.1] • use iteration when designing algorithms [Syllabus reference 2.1.2] | | | |
| Paper 2: Topic 11 | Data types and additional programming techniques | <ul style="list-style-type: none"> • explain what is meant by 'data type' and list some common types [Syllabus reference 2.2.2] • use the correct data types in algorithms [Syllabus reference 2.2.2] • carry out various manipulations such as finding the length of and slicing and concatenating 'string' data types [Syllabus reference 2.2.3] • create and work with simple array data structures [Syllabus reference 2.2.3] • create and work with two-dimensional arrays [Syllabus reference 2.2.3] • use basic file handling operations [Syllabus reference 2.2.3] • use records to store data [Syllabus reference 2.2.3] | Pizza Ordering system creator | <p>Interactive challenges within unit</p> <p>Coding opportunities</p> | <ul style="list-style-type: none"> • <i>String manipulation</i> • <i>Index</i> • <i>String traversal</i> • <i>Concatenation</i> • <i>Casting</i> • <i>Array</i> • <i>Two-dimensional array</i> • <i>File handle</i> • <i>Write mode</i> • <i>Read mode</i> • <i>Subroutine</i> |

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| | | <ul style="list-style-type: none"> • use SQL to search data [Syllabus reference 2.2.3] • use sub programs to produce structured code [Syllabus reference 2.2.3] • generate random numbers [Syllabus reference 2.2.3] | | | |
| Paper 2: Topic 12 | Searching and Sorting Algorithms | <ul style="list-style-type: none"> • explain why sorted lists are of more value than unsorted lists [Syllabus reference 2.1.3] • describe the bubble sort, selection sort and merge sort algorithms [Syllabus reference 2.1.3] • use these algorithms to sort lists into ascending and descending order [Syllabus reference 2.1.3] • describe the linear and binary search algorithms [Syllabus reference 2.1.3] • use these algorithms to search sorted and unsorted lists [Syllabus reference 2.1.3] | Evidenced through ability to complete different sorting algorithms | <p>Interactive challenges within unit</p> <p>Coding opportunities</p> | <ul style="list-style-type: none"> • <i>Bubble sort</i> • <i>Insertion sort</i> • <i>Merge sort</i> • <i>Sequential</i> • <i>Linear sort</i> • <i>Binary search</i> |

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| <p>Paper 2, Topic 13</p> | <p>Creating Robust Programs</p> | <ul style="list-style-type: none"> • explain how developers consider security when designing software [Syllabus reference 2.3.1] • describe how authentication is used in software [Syllabus reference 2.3.1] • describe how input validation is used [Syllabus reference 2.3.1] • discuss the maintainability of software [Syllabus reference 2.3.1] • explain the purpose of testing [Syllabus reference 2.3.2] • describe the types of testing that can be used [Syllabus reference 2.3.2] • explain the difference between logic and syntax errors [Syllabus reference 2.3.2] • describe the use of test data [Syllabus reference 2.3.2] | <p>Password Authentication program creator</p> | <p>Interactive challenges within unit</p> <p>Coding opportunities</p> | <ul style="list-style-type: none"> • <i>Authentication</i> • <i>Validation</i> • <i>Maintainability</i> • <i>Modular testing</i> • <i>Iterative testing</i> • <i>Terminal testing</i> • <i>Syntax error</i> • <i>Logic error</i> |
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| <p>Paper 2, Topic 14</p> | <p>Boolean Logic</p> | <ul style="list-style-type: none"> • create truth tables for Boolean operators [Syllabus reference 2.4.1] • draw AND, OR and NOT logic gates [Syllabus reference 2.4.1] • combine logic gates into logic circuits [Syllabus reference 2.4.1] • create truth tables for logic circuits [Syllabus reference 2.4.1] | <p>Evidenced through ability to complete logic circuits and truth tables</p> | <p>Interactive challenges</p> | <ul style="list-style-type: none"> • Boolean logic • Truth table • Logic gate • AND gate • OR gate • NOT gate • Logic circuit |
| <p>Paper 2, Topic 15</p> | <p>Programming Languages and Integrated Development Environments</p> | <ul style="list-style-type: none"> • describe the difference between low and high level languages [Syllabus reference 2.5.1] • explain the advantages of using high level languages [Syllabus reference 2.5.1] • explain how program instructions are encoded in low level languages [Syllabus reference 2.5.1] • explain why high level languages need to be translated [Syllabus reference 2.5.1] • explain the characteristics and use of <ul style="list-style-type: none"> • an assembler • a compiler • an interpreter | <p>Mini examination</p> | <p>School Trip to National Videogame Museum</p> | <ul style="list-style-type: none"> • Machine code • Machine language • Instruction set • Opcode • Operand • Assembly language • Mnemonic • Assembler • High level language • Low level language • Compiler • Interpreter |

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| | | <ul style="list-style-type: none">• discuss the tools and facilities available in an integrated development environment [Syllabus reference 2.5.2] | | | |
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YEAR 11

| Term | Programme of Learning | Links to the National Curriculum / Specification / Additional | Assessments | What extra learning opportunities are planned? | Disciplinary Literacy |
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| Paper 1, Topic 1 | The Central Processing Unit | <ul style="list-style-type: none"> • explain the purpose of the Central Processing Unit (CPU) [Syllabus reference 1.1.1] • describe the components of the CPU and their functions [Syllabus reference 1.1.1] • describe the fetch-execute cycle [Syllabus reference 1.1.1] • describe Von Neumann architecture • explain how the cache size, clock speed and number of cores affect CPU performance [Syllabus reference 1.1.2] • explain the purpose of and characteristics of an embedded system [Syllabus reference 1.1.3] | Mini examination assessment | Interactive challenges | <ul style="list-style-type: none"> • <i>Embedded system</i> • <i>Central processing unit</i> • <i>Von Neumann architecture</i> • <i>Fetch-execute cycle</i> • <i>Random access memory</i> |

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| <p>Paper 1, Topic 2</p> | <p>Primary and Secondary Storage</p> | <ul style="list-style-type: none"> • explain the need for primary storage [Syllabus reference 1.2.1] • describe the purposes and differences of RAM and ROM [Syllabus reference 1.2.1] • explain how virtual memory works [Syllabus reference 1.2.1] • explain the need for secondary storage [Syllabus reference 1.2.2] • describe common types of storage devices [Syllabus reference 1.2.2] • describe the advantages and disadvantages of different storage devices [Syllabus reference 1.2.2] • explain why data needs to be converted into a binary format to be processed by a computer [Syllabus reference 1.2.3] • describe the units of data storage [Syllabus reference 1.2.3] | <p>Create presentation on what pupils have learnt</p> | <p>Interactive challenges</p> | <ul style="list-style-type: none"> • <i>Random access memory</i> • <i>Read-only memory</i> • <i>Storage location (address)</i> • <i>Volatile</i> • <i>Virtual memory</i> • <i>Secondary storage device</i> • <i>Magnetic storage</i> • <i>Optical storage</i> • <i>Solid state storage</i> |
| <p>Paper 1, Topic 3</p> | <p>Data Representation</p> | <ul style="list-style-type: none"> • convert binary numbers into denary and vice versa [Syllabus reference 1.2.4] • carry out addition on binary numbers [Syllabus reference 1.2.4] • explain what overflow is, when it occurs, why it occurs | <p>Use python to create a binary conversion calculator.</p> | <p>Interactive worksheets</p> | <ul style="list-style-type: none"> • <i>Hexadecimal</i> • <i>Character set</i> • <i>ASCII code</i> • <i>Unicode</i> • <i>Pixel</i> • <i>Resolution</i> • <i>Colour depth</i> |

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| | | <p>and what it means [Syllabus reference 1.2.4]</p> <ul style="list-style-type: none"> • use left and right shifts when multiplying or dividing binary numbers by powers of 2 [Syllabus reference 1.2.4] • explain why hexadecimal numbers are used [Syllabus reference 1.2.4] • convert between binary, denary and hexadecimal [Syllabus reference 1.2.4] • explain how characters are represented in binary [Syllabus reference 1.2.4] • calculate the ASCII code for any character [Syllabus reference 1.2.4] • explain the differences between ASCII, extended ASCII and Unicode [Syllabus reference 1.2.4] • explain how images are represented in binary [Syllabus reference 1.2.4] • calculate the size of an image file [Syllabus reference 1.2.4] • explain the purpose of metadata [Syllabus reference 1.2.4] • explain how sound is represented in binary [Syllabus reference 1.2.4] | | | <ul style="list-style-type: none"> • Metadata • Analogue and digital • Sampling • Sample rate • Bit depth • Compression • Binary • Lossless compression • Lossy compression |
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| | | <ul style="list-style-type: none"> • calculate the size of an audio file [Syllabus reference 1.2.4] • explain the disadvantages of large image and audio files [Syllabus reference 1.2.4] • explain the differences between lossless and lossy file compression [Syllabus reference 1.2.4] | | | |
| Paper 1, Topic 4 | Networks | <ul style="list-style-type: none"> • explain what is meant by a computer network and list the different types of networks [Syllabus reference 1.3.1] • describe the factors that affect the performance of networks [Syllabus reference 1.3.1] • describe the differences between client server and peer-to-peer networks [Syllabus reference 1.3.1] • explain the functions of the hardware needed to connect computers [Syllabus reference 1.3.1] • explain how computers communicate using cable and microwave [Syllabus reference 1.3.1] • describe how the internet is a network of networks [Syllabus reference 1.3.1] | Create a report for a business examining their current internet set up | Interactive challenges | <ul style="list-style-type: none"> • Local area network (LAN) • Wide area network (WAN) • Peer-to-peer network • Client-server network • Network interface card (NIC) • Media Access Control (MAC) • Wireless access point • Switch • Router • Ethernet • Protocol • Bandwidth |

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| | | <ul style="list-style-type: none"> • explain the features of IP addresses [Syllabus reference 1.3.1] • explain the purposes and roles of DNS and web servers [Syllabus reference 1.3.1] • explain the use of the cloud for data and software storage [Syllabus reference 1.3.1] • describe the benefits and drawbacks of using the cloud [Syllabus reference 1.3.1] • describe star and mesh network topologies [Syllabus reference 1.3.1] • recommend a topology for a particular scenario [Syllabus reference 1.3.1] | | | |
| Paper 1, Topic 5 | Protocols and Layers | <ul style="list-style-type: none"> • explain how data is transmitted across the internet [Syllabus reference 1.3.2] • explain the use of protocols [Syllabus reference 1.3.2] • describe the purposes and functions of protocols [Syllabus reference 1.3.2] • explain how layers are used in protocols [Syllabus reference 1.3.2] | Mini examination | Interactive challenges | <ul style="list-style-type: none"> • IP address • Packets • Packet switching • Transmission Control Protocol / Internet protocol (TCP/IP) • Networking layers |

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| <p>Paper 1, Topic 6</p> | <p>Threats to Computer Systems and Networks</p> | <ul style="list-style-type: none"> • describe the different strategies that criminals use to attack computer networks [Syllabus reference 1.4.1] • explain how people are the greatest security risks to networks [Syllabus reference 1.4.1] • describe the threats posed to networks [Syllabus reference 1.4.1] • explain how these threats can be identified, prevented and combatted [Syllabus reference 1.4.1] | <p>Mini exam</p> | <p>Interactive challenges</p> | <ul style="list-style-type: none"> • <i>Social engineering</i> • <i>Blagging</i> • <i>Phishing</i> • <i>Pharming</i> • <i>Malware</i> • <i>Virus</i> • <i>Worm</i> • <i>Trojan</i> • <i>Spyware</i> • <i>Adware</i> • <i>Brute force attack</i> • <i>Denial of service</i> • <i>SQL injection</i> • <i>Encryption</i> |
| <p>Paper 1, Topic 7</p> | <p>Operating Systems and Utility Software</p> | <ul style="list-style-type: none"> • explain what is meant by systems software [Syllabus reference 1.5.1] • explain what is meant by an operating system [Syllabus reference 1.5.1] • describe the functions of the operating system [Syllabus reference 1.5.1] • explain what is meant by utility systems software [Syllabus reference 1.5.2] • list some examples of utility systems software and their functions [Syllabus reference 1.5.2] | <p>Mini exam</p> | <p>Interactive challenges</p> | <ul style="list-style-type: none"> • <i>Drivers</i> • <i>User interface</i> • <i>Graphical user interface</i> • <i>Command line interface</i> • <i>Utility software</i> • <i>Defragmentation</i> • <i>Data compression</i> |

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| <p>Paper 1, Topic 8</p> | <p><i>Ethical, legal, cultural and environmental impacts of digital technology</i></p> | <ul style="list-style-type: none"> • discuss the following issues in relation to the impact of digital technology on society: • ethical • legal • cultural • environmental • privacy [Syllabus reference 1.6.1] • discuss the following legislation relevant to digital technology: • The Data Protection Act 2018 • Computer Misuse Act 1990 • Copyright Designs and Patents Act 1988 • Software licences [Syllabus reference 1.6.1] | <p>Exam</p> | <p>Interactive challenges</p> | <ul style="list-style-type: none"> • <i>Environmental issues</i> • <i>e-waste</i> • <i>Ethical issues</i> • <i>Digital divide</i> • <i>Data protection act</i> • <i>Computer misuse act</i> • <i>Copyright Designs and Patents Act</i> • <i>Copyright</i> • <i>Patent</i> • <i>Proprietary software</i> • <i>Open source software</i> |
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