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| A picture containing text  Description automatically generated | | Computing Curriculum Autumn 23 | |
|  | YEAR 7 | YEAR 8 | YEAR 9 |
| AUT 1 TOPIC | **Clear messaging in digital media** | **Web Development** | **Programming – Python Sequences** |
| Key Focus | Choose suitable search terms to find relevant content on the web.  Identify features that help visually communicate the message.  Plan a digital artefact to include features identified as good.  Use a combination of applications to create a digital artefact.  Plan a multi-page digital artefact with consistent styling. | Explain what HyperText Markup Language (HTML) is used for.  Explain that websites are made up of multiple web pages.  Explain that web pages in a website are arranged hierarchically.  Outline how search engines crawl the World Wide Web to create an index.  Explain how search engines select and rank results.  Explain how individual search engines have their own ranking algorithms. | Describe and create lists in Python.  Access elements of lists and perform operations.  Describe what strings.  Access and perform operations and individual elements of strings.  Use iteration over lists and strings.  Combine features to develop solutions to meaningful problems. |
| Literacy/Numeracy Skills | **Literacy**  Reading opportunities throughout  Keyword research  **Numeracy**  Problem solving | **Literacy**  Reading opportunities throughout  Keyword research  **Numeracy**  Angles of shapes  HTML editor | **Literacy**  Reading opportunities throughout  Keyword research  **Numeracy**  Use of operators  Problem solving |
| Taxonomy | CM DD ET SS | DI ET PG | AL CS |
| Resources | 365 Applications  OneNote  Workbooks | HTML Editor  OneNote  Workbooks | Online resources  OneNote  Python |
| Careers | Social Media Marketing  Copyrighting  Web Design  Advertising | Backend & Front-End Developer  SEO specialist  Civil CAD Designer  Graphic Artist | Artificial Intelligence Specialist  Machine Learning Engineer  Backend & Front-End Developer  Software Engineer |
| Prerequisites | KS2 knowledge | Year 7 Programming and Network knowledge | Understanding how to run Python environment, write and execute Python programs. |
| National Curriculum Links | 3.8 and 3.9 | 3.4, 3.5 and 3.6 | 3.1, 3.2, 3.3 and 3.6 |
| Education for a Connected World | Online bullying  Online relationships  Privacy and security | Privacy and security | Privacy and security |
| Assessment | **Assessment Rubric**  Self-assessment during unit of work. | Summative assessment Multiple choice questions to assess learners understanding. | **Formative Assessment**  Students complete lesson worksheets to check understanding. Summative assessment Multiple choice questions to assess learners understanding. |

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| AUT 2 TOPIC | **Networks** | **Computer Systems** | **Programming – Project I** |
| Key Focus | Define what a computer network is and list associated hardware.  Define ‘bandwidth’, using the appropriate units for measuring the rate at which data is transmitted.  Explain how data is transmitted between computers across networks.  Explain the difference between the internet, its services, and the World Wide Web.  Describe how internet-connected devices can affect us. | Explain the difference between a general-purpose computing system and a purpose-built device.  Describe the function of the hardware components used in computing systems.  Explain how hardware components work together in order to execute programs.  Explain the role of an operating system in controlling program execution. | Students start working on their Computer Science Entry Level programming project.  Programming project intent is outlined.  Success criteria of proposed project is identified for later evaluation.  Projects are planned and designed to aid the development process.  Programming projects are started using students preferred programming language of choice from Python or Scratch. |
| Literacy/Numeracy Skills | **Literacy**  Reading opportunities throughout  Keyword research  **Numeracy**  Calculation of data transition rates | **Literacy**  Reading opportunities throughout  Keyword research  **Numeracy**  Calculation of hardware requirements  Memory allocation | **Literacy**  Reading opportunities throughout  **Numeracy**  Use of operators  Problem solving |
| Taxonomy | CM DD ET SS IT | CM DD DI ET | CM DD AL PG ET |
| Resources | Online resources  OneNote  Workbooks | Online resources  OneNote  Workbooks | Online resources  OneNote  Teams  Scratch / Python |
| Careers | Computer Technician  Network Technician  Network Administrator  Network Analyst | Computer Operator  Technical Support Specialist  Computer Programmer  Video Game Designer | Artificial Intelligence Specialist  Machine Learning Engineer  Backend & Front-End Developer  Software Engineer |
| Prerequisites | KS2 knowledge |  | Knowledge from Scratch and Python |
| National Curriculum Links | 3.8 and 3.9 Curriculum | 3.7 and 3.8lum | 3.1, 3.2, 3.3 and 3.6 |
| Education for a Connected World | Online bullying  Online relationships  Privacy and security |  |  |
| Assessment | Summative assessment Multiple choice questions to assess learners understanding. | **Formative Assessment**  Students complete lesson worksheets to check understanding. Summative assessment Multiple choice questions to assess learners understanding. | **Formative Assessment**  Students complete lesson worksheets to check understanding.  **Assessment Rubric**  Self-assessment once project is complete. |

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| SPR1 TOPIC | **Using media** | **Vector Graphics** | **Programming Project II** |
| Key Focus | Select the most appropriate software to use to complete a task.  Identify the key features of a word processor and apply them appropriately.  Demonstrate an understanding of licensing issues involving online content by applying appropriate Creative Commons licences.  Apply techniques in order to identify whether or not a source is credible.  Design the layout of the content to make it suitable for the audience. | Create objects and change their properties.  Manipulate groups of objects.  Combine paths by applying operations.  Change the form of an object by moving nodes.  Use tools and techniques to create a vector graphic for a given purpose.  Review and improve a vector graphic. | Programming projects are continued and completed using students preferred programming language of choice.  Students carry out testing phases of their programming project.  Evaluation of programming projects carried out to see if success criteria was achieved. |
| Literacy/Numeracy Skills | **Literacy**  Reading opportunities throughout  Keyword research  **Numeracy** | **Literacy**  Reading opportunities throughout  Keyword research  **Numeracy**  Use of angles | **Literacy**  Reading opportunities throughout  **Numeracy**  Use of operators  Problem solving |
| Taxonomy | CS NW | CS DI IT PG | CM DD AL PG ET |
| Resources | Online resources  OneNote | Online resources  OneNote  Vector drawing puzzles | Online resources  OneNote  Teams  Scratch / Python |
| Careers | Social Media Marketing  Copyrighting  Web Design  Advertising | Production Artist  Multimedia Creative Architect | Artificial Intelligence Specialist  Machine Learning Engineer  Backend & Front-End Developer  Software Engineer |
| Prerequisites | KS2 knowledge |  | Knowledge from Scratch and Python |
| National Curriculum Links | 3.5 | 3.7 | 3.8 |
| Education for a Connected World | Online bullying  Online relationships  Privacy and security |  | Copyright and ownership  Managing online information |
| Assessment | Summative assessment Multiple choice questions to assess learners understanding.  **Assessment Rubric**  Self-assessment once project is complete. | Summative assessment Multiple choice questions to assess learners understanding.  **Assessment Rubric**  Self-assessment once vector project is complete. | **Formative Assessment**  Students complete lesson worksheets to check understanding. Summative assessment Multiple choice questions to assess learners understanding. |

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| SPR2 TOPIC | **Programming – Scratch I** | **Representation** | **Data Science** |
| Key Focus | Recognise that computers follow the control flow of input/process/output.  Compare how humans and computers understand instructions (understand and carry out).  Define a sequence as instructions performed in order, with each executed in turn.  Define a variable as a name that refers to data being held by the computer.  Define a condition as an expression that will be evaluated as either true or false. | List examples of representations of information.  Outline how representations are used to store, communicate, and process information.  Provide examples of how different representations are appropriate for different tasks.  Recall that binary digits are used to represent all information that is stored, transmitted, and processed by computers.  Provide examples of the different ways that binary digits are physically represented in digital devices. | Explain how visualising data can help us identify patterns and trends.  Use software to visualise data sets and look for patterns or trends.  Select criteria and use data sets to investigate predictions.  Evaluate findings to support arguments for or against a prediction.  Solve a problem by implementing steps of the investigative cycle on a data set.  Analyse visualisation to identify patterns, trends and outliers.  Draw conclusions and report findings. |
| Literacy/Numeracy Skills | **Literacy**  Reading opportunities throughout  Keyword research  **Numeracy**  Use of operators  Problem solving | **Literacy**  Reading opportunities throughout  Keyword research  **Numeracy**  Using binary numbers | **Literacy**  Reading opportunities throughout  Keyword research  **Numeracy** |
| Taxonomy | CM DD ET IT | AL CM CS DD DI ET IT NW PG SS | CM ET |
| Resources | Online Resources  OneNote  Scratch | Online Resources  OneNote  Pixel worksheets | Online resources  OneNote |
| Careers | Artificial Intelligence Specialist  Machine Learning Engineer  Backend & Front-End Developer  Software Engineer | Data specialist  Client services coordinator  Marketing specialist  Business systems analyst | Data analyst  Data engineers  Database administrator |
| Prerequisites | KS2 knowledge |  |  |
| National Curriculum Links | 3.7 and 3.8 | 3.8 | 3.8 |
| Education for a Connected World |  |  |  |
| Assessment | **Assessment Rubric**  Self-assessment once project is complete. | Summative assessment Multiple choice questions to assess learners understanding. | **Formative Assessment**  Students complete lesson worksheets to check understanding. Summative assessment Multiple choice questions to assess learners understanding. |

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| SUM1 TOPIC | **Programming – Scratch 2** | **Mobile App Development** | **Representation** |
| Key Focus | Define iteration as a group of instructions that are repeatedly executed.  Define a subroutine as a group of instructions that will run when called by the main program or other subroutines.  Define a list as a collection of related elements that are referred to by a single variable name. | Use a block-based programming language to create a sequence.  Use variables in an event-driven programming environment.  Pass the value of a variable into an object.  Use user input in an event-driven programming environment.  Use a block-based programming language to include selection. | Describe how digital images are composed out of individual elements.  Define key terms such as ‘pixels’, ‘resolution’, and ‘colour depth’.  Describe how digital images and sounds can be represented as a sequence of bits.  Explain how the manipulation of digital images and sounds amounts to arithmetic operations.  Describe the link between file size and quality for digital media.  Define ‘compression’ and describe why it is necessary. |
| Literacy/Numeracy Skills | **Literacy**  Reading opportunities throughout  Keyword research  **Numeracy**  Use of operators  Problem solving | **Literacy**  Reading opportunities throughout  Keyword research  **Numeracy**  Use of operators  Problem solving | **Literacy**  Reading opportunities throughout  Keyword research  **Numeracy**  Using binary numbers  Pixel puzzles |
| Taxonomy | AL DD PG | CS DI | CM DD DI ET IT |
| Resources | Online Resources  OneNote  Scratch | Online Resources  OneNote | Online Resources  OneNote  Pixel worksheets |
| Careers | Artificial Intelligence Specialist  Machine Learning Engineer  Backend & Front-End Developer  Software Engineer | iOS developer  Android developer  Mobile engineer  Application developer | Data specialist  Client services coordinator  Marketing specialist  Business systems analyst |
| Prerequisites | Knowledge for programming Scratch I | Knowledge from previous programming units. | Data representation from Year 8. |
| National Curriculum Links | 3.8 | 3.6 | 3.7 |
| Education for a Connected World | Privacy and security |  | Copyright and ownership  Managing online information |
| Assessment | **Assessment Rubric**  Self and peer assessment once project is complete. | Summative assessment Multiple choice questions to assess learners understanding.  **Assessment Rubric**  Self-assessment once App project is complete. | Summative assessment Multiple choice questions to assess learners understanding. |

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| SUM2 TOPIC | **Spreadsheets - Modelling** | **Programming – Python I** | **Cybersecurity** |
| Key Focus | Explain how data is structured using cells.  Recognise that cells can contain static data or calculated data which is dynamic.  Identify how conditional formatting provides information.  Combine a range of tools to answer given questions. | Describe differences between algorithms and programs.  Arrange program statements in a sequence.  Use binary selection to control the flow of program execution.  Use selection to control the flow of program execution.  Use iteration to control the flow of program execution.  Combine iteration and selection. | Explain the difference between data and information.  Identify what happens to data entered online.  Explain the need for the Data Protection Act.  Recognise how data breaches are caused by humans.  Examine how different types of malware cause problems for computer systems.  Explain how networks can be protected from common security threats. |
| Literacy/Numeracy Skills | **Literacy**  Reading opportunities throughout  Keyword research  **Numeracy**  Data collection and presentation | **Literacy**  Reading opportunities throughout  Keyword research  **Numeracy**  Use of operators  Problem solving | **Literacy**  Reading opportunities throughout  Keyword research  **Numeracy**  Pattern spotting  Mathematical sequencing  Problem solving |
| Taxonomy | AL DD PG | AL DD ET PG | CM CS DI ET IT |
| Resources | MicroSoft Excel  OneNote | Online resources  OneNote | Online Resources  OneNote |
| Careers | Financial analyst  Administrative assistants  Retail store managers  Project managers | Artificial Intelligence Specialist  Machine Learning Engineer  Backend & Front-End Developer  Software Engineer | Security architect  Cybersecurity engineer  Malware analyst  Penetration tester |
| Prerequisites | The unit assumes that learners have little to no experience of using spreadsheets. | Previous programming knowledge. |  |
| National Curriculum Links | 3.2, 3.3, 3.4 and 3.8 | 3.1, 3.2, 3.3 and 3.8 | 3.9 |
| Education for a Connected World | Privacy and security |  | Privacy and security |
| Assessment | Summative assessment Learners complete the assessment by manipulating and analysing spreadsheet data. | **Formative Assessment**  Students complete lesson worksheets to check understanding. Summative assessment Multiple choice questions to assess learners understanding. | Summative assessment Multiple choice questions to assess learners understanding. |

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| **Statement Number** | **National Curriculum Statement** |
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| 3.1 | design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems |  |
| 3.2 | understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem |  |
| 3.3 | 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 |  |
| 3.4 | 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] |  |
| 3.5 | understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems |  |
| 3.6 | 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 |  |
| 3.7 | 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 |  |
| 3.8 | Create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability |  |
| 3.9 | 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. |  |

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| **Computing Taxonomy** | | |
| **Abbreviation** | **Strand** | **Description** |
| NW | Networks | Understand how networks can be used to retrieve and share information, and how they come with associated risks |
| CM | Creating media | Select and create a range of media including text, images, sounds, and video |
| DI | Data and information | Understand how data is stored, organised, and used to represent real-world artefacts and scenarios |
| DD | Design and development | Understand the activities involved in planning, creating, and evaluating computing artefacts |
| CS | Computing systems | Understand what a computer is, and how its constituent parts function together as a whole |
| IT | Impact of technology | Understand how individuals, systems, and society as a whole interact with computer systems |
| AL | Algorithms | Be able to comprehend, design, create, and evaluate algorithms |
| PG | Programming | Create software to allow computers to solve problems |
| ET | Effective use of tools | Use software tools to support computing work |
| SS | Safety and security | Understand risks when using technology, and how to protect individuals and systems |