| | Year 7 | Year 8 | Year 9 |
|---|---|---|---|
| **Unit** | Networking – Esafety, using computers (folders etc) and the internet | Computational thinking – Turtle programming and algorithms | Computational thinking – programming algorithms |
| **Objectives** | Obtain content from the world wide web using a web browser.<br><br>Know what to do when concerned about content or being contacted.<br><br>Navigate the web and can carry out simple web searches to collect digital content.<br><br>Explain the difference between a web browser and a search engine.<br><br>Understand the importance of communicating safely and respectfully online, and the need for keeping personal information private.<br><br>Understand how to effectively use search engines.<br><br>Summarise the difference between the internet and internet service e.g. world wide web.<br><br>Show an awareness of, and use a range of internet services e.g. VOIP. | Demonstrate simple algorithms using loops, and selection.<br><br>Detect and correct errors i.e. debugging, in algorithms.<br><br>Construct solutions (algorithms) that use repetition and two-way selection.<br><br>Solve problems through decomposition.<br><br>Use logical reasoning to predict outputs, showing an awareness of inputs.<br><br>Select similarities and differences in situations and use these to solve problems (pattern recognition).<br><br>Find where information can be filtered out in generalising problem solutions (abstraction). | Use logical reasoning to predict outputs, showing an awareness of inputs.<br><br>Select similarities and differences in situations and uses these to solve problems (pattern recognition).<br><br>Find where information can be filtered out in generalising problem solutions (abstraction).<br><br>Develop solutions to complex problems independently.<br><br>Evaluate the effectiveness of algorithms and models for similar problems. |
| **NC links**<br><br>**(where applicable)** | A5, A6, A7, A9 | A2, A3, A9 | A2, A3, A9 |
| **Key Words** | Tier 2 State, identify, annotate, predict<br><br>Tier 3 Rules, expectation, folders, files, shortcuts, save, open, organise, sub-folders, safety, safe, trusted, responsible, trust, search engine, internet, world wide web, password, username, | Tier 2 Define, compare describe<br><br>Statement, iteration, loop, programming, algorithms, constant, input, flowchart, | Tier 2 Suggest, interrupt, predict, justify, critique<br><br>Statement, iteration, loop, programming, algorithms, constant, input, flowchart, high level language |
| **Homework** | N/A | Complete identified challenges previously set in homework booklet | Complete identified challenges previously set in homework booklet |
| **Career link**<br><br>**(Unifrog)** | Network manager, IT support, network engineer, e-learning developer | Animator, visual effects artist, web developer, computer game tester | Animator, visual effects artist, web developer, computer game tester |
| **Employability skills**<br><br>**(Highlight applicable)** | Aiming high    Literacy<br>Creativity    Numeracy<br>Leadership    Independence<br>Listening    Communication<br>Presenting    Teamwork<br>Problem solving    Staying positive | Aiming high    Literacy<br>Creativity    Numeracy<br>Leadership    Independence<br>Listening    Communication<br>Presenting    Teamwork<br>Problem solving    Staying positive | Aiming high    Literacy<br>Creativity    Numeracy<br>Leadership    Independence<br>Listening    Communication<br>Presenting    Teamwork<br>Problem solving    Staying positive |
| **Common misconceptions** | Students try to save files and open work directly from shared file. Students unsuccessfully opening wrong work. | Students will incorrectly use a range of incorrect commands until they become familiar with the set commands needed to successfully command edublocks. | Students will incorrectly use a range of incorrect commands until they become familiar with the set commands within set programming. |
| **Assessment** | Students will be formatively assessed through the course of the half term. Visually being assessed by how they can successfully navigate on a computer. Along with depth of written work. | Summative assessment using edublocks to assess understanding of programming content. | Midway assessment – verbal |
| **Notes / developments / standardisation comments** | | | |

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|---|---|---|---|
| **Unit** | Computers – input/outputs and memory | Networking – Networking basics | Programming – Further programming techniques in python |
| **Objectives** | Recognise that a range of digital devices can be considered a computer.<br><br>Recognise and use a range of input and output devices.<br><br>Recognise that all software executed on digital devices is programmed.<br><br>Explain the function of the main internal parts of basic computer architecture.<br><br>Outline the concepts behind the fetch-execute cycle.<br><br>Explain the difference between hardware and software, and their roles within a computer system. | Understand the importance of communicating safely and respectfully online, and the need for keeping personal information private.<br><br>Understand how to effectively use search engines.<br><br>Explain the difference between a web browser and a search engine.<br><br>Summarise the difference between the internet and internet service e.g. world wide web.<br><br>Show an awareness of, and use a range of internet services e.g. VOIP. | Identify the differences between, and appropriately use if and if, then and else statements.<br><br>Have practical experience of a high-level textual language.<br><br>Design, write and debug modular programs using functions.<br><br>Select appropriate variables and relational operators within a loop to govern termination.<br><br>Establish the difference between a while loop and a for loop.<br><br>Use a range of operators and expressions e.g. Boolean, and apply them in the context of program control. |

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| | Give examples of how data is stored on a computer.

Classify a range of software including operating systems, utility and application software. | Demonstrate data transmission between digital computers over networks, including the internet i.e. IP addresses and packet switching.

Construct static web pages using HTML

Examine the importance of network security including simple security techniques such as strong passwords. | Understand and apply parameter passing.

Understand and use two-dimensional data structures.

Test solutions thoroughly to determine the effectiveness of the solution.

Appreciate the effect of the scope of a variable. |
| **NC links**

**(where applicable)** | A5, A7, A8, A9 | A5, A7, A8, A9 | A2, A3, A9 |
| **Key Words** |
Tier 3 Input, output, devices, RAM, ROM, memory, cache, saving, recently, physical, digital, cloud, process, computer, research, components, browsers, |

Networking, computers, communication, LAN, WAN, wired, wireless, topology, hub, switch, router, WAP, protocols |

Statement, iteration, loop, programming, algorithms, constant, input, flowchart, high level language |
| **Homework** | Complete homework challenges – differentiated challenge by choice tasks | Complete homework challenges – differentiated challenge by choice tasks | Complete homework challenges – differentiated challenge by choice tasks |
| **Career link**

**(Unifrog)** | Software tester, CAD technician, IT support technician, IT manager, network manager | Network manager, IT support, network engineer, e-learning developer | Animator, visual effects artist, web developer, computer game tester |
| **Employability skills**

**(Highlight applicable)** | Aiming high          Literacy
Creativity          Numeracy
Leadership          Independence
Listening          Communication
Presenting          Teamwork
Problem solving          Staying positive | Aiming high          Literacy
Creativity          Numeracy
Leadership          Independence
Listening          Communication
Presenting          Teamwork
Problem solving          Staying positive | Aiming high          Literacy
Creativity          Numeracy
Leadership          Independence
Listening          Communication
Presenting          Teamwork
Problem solving          Staying positive |
| **Common misconceptions** | Students identify that memory and storage are the same thing. That it is all just 'stored on the computer' | Previously identifying that computers just can link with each other from any location 'without a network' | Incorrect written language used. Syntax and logic errors used within programming. |
| **Assessment** | Create something (e.g. a poster, leaflet, drawing) that will explain how computers work to someone in Year 6 | 'socrative.com/student' go to website and complete online assessment | Complete python programming task, followed by peer feedback and improvements |
| **Notes / developments / standardisation comments** | | | |

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|---|---|---|
| **SPRING 1** | | |
| **Unit** | Data representation - Excel | Data representation – How data is represented in computers | Computers – Introduction to Linux |
| **Objectives** | Recognise that digital content can be represented in many forms.

Distinguish between some of these forms and explain the different ways that they communicate information.

Understand the difference between data and information.

Know why sorting data in a flat file can improve searching for information.

Recognise that data can be structured in tables to make it useful.

Classify different types of data (text, number) and understands how these are used in different situations.

Demonstrate how filters or single criteria searches can find information.

Illustrate how digital computers use binary to represent all data.

Summarise the relationship between data representation and data quality. | Classify different types of data (text, number) and understands how these are used in different situations.

Demonstrate how filters or single criteria searches can find information.

Illustrate how digital computers use binary to represent all data.

Summarise the relationship between data representation and data quality.

Illustrate how bit patterns represent numbers, images and sound.

Examine how processors' instruction sets relate to low-level instructions carried out by a computer. | Use a range of application software to carry out designated tasks.

Investigate the differences between different Operating Systems, and the advantages and disadvantages of these.

Use the command line to model tasks commonly completed with the use of a GUI.

Develop your understanding of how Operating Systems manage files.

Choose an appropriate combination of commands to control a computer system effectively using just a command line. |

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|---|---|---|---|
| **NC links** (where applicable) | A1, A6, A7 | A1, A6, A7 | A2, A3, A9 |
| **Key Words** | Tier 3 Size, memory, excel, spreadsheet, cell, formula, reference, SUM, AVERAGE, MAX, MIN, chart, graph, purpose, field, data types, validation | Tier 2 Define, compare describe Character set, metadata, lossy, lossless, binary, decimal, hexadecimal, text, numbers, data, patterns, images, instructions, code. | Tier 2 Suggest, interrupt, predict, justify, critique Operating system, open source, GUI, command line, programming, functions, purposes. |
| **Homework** | Complete identified challenges previously set in homework booklet | Complete identified challenges previously set in homework booklet | Complete identified challenges previously set in homework booklet |
| **Career link** (Unifrog) | Animator, visual effects artist, web developer, computer game tester | Animator, visual effects artist, web developer, computer game tester | Animator, visual effects artist, web developer, computer game tester |
| **Employability skills** (Highlight applicable) | Aiming high   Literacy Creativity   Numeracy Leadership   Independence Listening   Communication Presenting   Teamwork Problem solving   Staying positive | Aiming high   Literacy Creativity   Numeracy Leadership   Independence Listening   Communication Presenting   Teamwork Problem solving   Staying positive | Aiming high   Literacy Creativity   Numeracy Leadership   Independence Listening   Communication Presenting   Teamwork Problem solving   Staying positive |
| **Common misconceptions** | Students will forget to use the = when identifying a formula. Or click and give wrong function to a formula resulting in wrong answer. | Students incorrectly getting mixed up between 1 = on, 0 = off. Mis calculation during addition. | Identifying that the only OS is windows. |
| **Assessment** | Database 'whodunit' | '. socrative.com/student' go to website and complete online assessment | Linux programming assessment. Following task identified via assessment. Graded 1-4 |
| **Notes / developments / standardisation comments** | | | |

| SPRING 2 | | | |
|---|---|---|---|
| **Unit** | IT – Graphic design and copyright | Programming – Text based game programming | IT – Artificial intelligence |
| **Objectives** | Demonstrate the use of computers safely and responsibly, knowing a range of ways to report unacceptable content and contact when online. Demonstrate how to store and edit digital content using appropriate file and folder names. Understand the legal frameworks governing the use of information. Show an awareness for the quality of digital content collected. Share your experiences of technology in school and beyond the classroom. Talk about your work and make improvements to solutions based on feedback received. Use a variety of software to manipulate and present digital content: data and information. Create digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience | Demonstrate how arithmetic operators, if statements, and loops, are used within programs. Declare and assigns variables. Use logical reasoning to predict the behaviour of programs. Build programs that implement algorithms to achieve given goals. Identify the differences between, and appropriately uses if and if, then and else statements. Have practical experience of a high-level textual language. Design, write and debug modular programs using functions. Select appropriate variables and relational operators within a loop to govern termination. Establish the difference between a while loop and a for loop. | Undertake creative projects that collect, analyse, and evaluate data to meet the needs of a known user group. Effectively design and create digital artefacts for a wider or remote audience. Make judgements about digital content when evaluating and repurposing it for a given audience. Recognise the audience when designing and creating digital content Use criteria to evaluate the quality of solutions, identify improvements making some refinements to the solution, and future solutions. Debate ethical issues surrounding the application of information technology beyond school. Evaluate and explain how the use of technology can impact on society. |
| **NC links** (where applicable) | A5, A7, A8 | A2, A3, A9 | A5, A7, A8 |
| **Key Words** | Tier 2 State, identify, annotate, predict, design Digital, content, packaging, software, legal, laws, internet, web browser, surfing | Tier 2 Define, compare describe Statement, iteration, loop, programming, algorithms, constant, input, flowchart, high level language | Tier 2 Suggest, interrupt, predict, justify, critique Artificial intelligence, internet of things, smart technology, |
| **Homework** | Complete identified challenges previously set in homework booklet | Complete identified challenges previously set in homework booklet | Complete identified challenges previously set in homework booklet |
| **Career link** (Unifrog) | Industrial designer, packaging designer, web designer, CAD technician, system analyst | Animator, visual effects artist, web developer, computer game tester | Computer game designer, computer game tester |

| | | | |
|---|---|---|---|
| **Employability skills**<br><br>(Highlight applicable) | Aiming high　　Literacy<br>Creativity　　Numeracy<br>Leadership　　Independence<br>Listening　　Communication<br>Presenting　　Teamwork<br>Problem solving　　Staying positive | Aiming high　　Literacy<br>Creativity　　Numeracy<br>Leadership　　Independence<br>Listening　　Communication<br>Presenting　　Teamwork<br>Problem solving　　Staying positive | Aiming high　　Literacy<br>Creativity　　Numeracy<br>Leadership　　Independence<br>Listening　　Communication<br>Presenting　　Teamwork<br>Problem solving　　Staying positive |
| **Common misconceptions** | Students will be unable to use some pieces of unfamiliar software. Will take learning to ensure this is not an issue. | Ensuring students remember programming techniques from previously taught units. | Struggle to identify what an ethical issue is. Usually get mixed up with legal etc. |
| **Assessment** | Complete assessment via multiple choice quiz. Return to improve magazine cover using peer feedback | Assess via edublocks the understanding of students from saved work. This will be identified via grade descriptors previously created | Written assessment, using creative writing to explore understanding or AI. |
| **Notes / developments / standardisation comments** | | | |

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| **SUMMER 2** | |

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|---|---|---|---|
| **Unit** | Computational thinking – algorithm and decomposition | Computers – Software and hardware | Networking - Cryptography |
| **Objectives** | Define what an algorithm is.<br><br>Reproduce/follow algorithms step-by-step.<br><br>Understand that computers need precise instructions.<br><br>Demonstrate care and precision to avoid errors.<br><br>Demonstrate simple algorithms using loops, and selection.<br><br>Detect and correct errors i.e. debugging, in algorithms.<br><br>Construct solutions (algorithms) that use repetition and two-way selection.<br><br>Solve problems through decomposition. | Explain the difference between hardware and software, and their roles within a computer system.<br><br>Give examples of how data is stored on a computer.<br><br>Classify a range of software including operating systems, utility and application software.<br><br>Use a range of application software to carry out designated tasks.<br>Investigate the differences between different Operating Systems, and the advantages and disadvantages of these. | Demonstrate data transmission between digital computers over networks, including the internet i.e. IP addresses and packet switching.<br><br>Examine the importance of network security including simple security techniques such as strong passwords.<br><br>Build models to demonstrate how cryptography is used for encrypting and decrypting data.<br><br>Experiment with some common network security methods, including public key encryption.<br><br>Debate the ethical and moral implications on cryptography from a personal, national and world-wide standpoint. |
| **NC links**<br><br>(where applicable) | A1, A4, A6, A7 | A5, A7, A8, A9 | A5, A7, A8, A9 |
| **Key Words** | **Tier 2 State, identify, annotate, predict**<br><br>Tier 3 Algorithms, flowchart, loop, statement, constant, selection, debugging | **Tier 2 Define, compare describe**<br><br>Hardware, software, operating system, data, storage, productivity, programs, utility, roles | **Tier 2 Suggest, interrupt, predict, justify, critique**<br><br>Cryptography, usernames, passwords, DDOS, decryption, encryption, packet switching, protocols, |
| **Homework** | Complete identified challenges previously set in homework booklet | Complete identified challenges previously set in homework booklet | Complete identified challenges previously set in homework booklet |
| **Career link**<br><br>(Unifrog) | Software tester, CAD technician, IT support technician, IT manager, network manager | Software tester, CAD technician, IT support technician, IT manager, network manager | Network manager, IT support, network engineer, e-learning developer |
| **Employability skills**<br><br>(Highlight applicable) | Aiming high　　Literacy<br>Creativity　　Numeracy<br>Leadership　　Independence<br>Listening　　Communication<br>Presenting　　Teamwork<br>Problem solving　　Staying positive | Aiming high　　Literacy<br>Creativity　　Numeracy<br>Leadership　　Independence<br>Listening　　Communication<br>Presenting　　Teamwork<br>Problem solving　　Staying positive | Aiming high　　Literacy<br>Creativity　　Numeracy<br>Leadership　　Independence<br>Listening　　Communication<br>Presenting　　Teamwork<br>Problem solving　　Staying positive |
| **Common misconceptions** | Students will confuse an algorithm in programming. Many students have very little technical vocabulary to support learning. | Students are unfamiliar with operating systems and their role within a computer. | Students are not fully aware of the complete setting up of networks and will have gaps in their knowledge. |
| **Assessment** | Complete online assessment at 'socrative.com' | '. socrative.com/student' go to website and complete online assessment | Assessment of edublocks game, followed by improvement after peer feedback. |
| **Notes / developments /** | | | |

| | standardisation comments | | | |
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<table>
<tr><td colspan="4" align="center"><strong>SUMMER 2</strong></td></tr>
<tr><td><strong>Unit</strong></td><td>Programming – Basic programming techniques (Scratch)</td><td>IT – Using technology safely</td><td>Data representation – Boolean logic and processing</td></tr>
<tr><td><strong>Objectives</strong></td>
<td>Observe that programs execute by following precise instructions.<br><br>Execute, check and change programs.<br><br>Know 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.<br><br>Detect and correct simple semantic errors i.e. debugging, in programs.<br><br>Demonstrate how arithmetic operators, if statements, and loops, are used within programs.<br><br>Declare and assign variables.<br><br>Use logical reasoning to predict the behaviour of programs.<br><br>Build programs that implement algorithms to achieve given goals.</td>
<td>Show an awareness for the quality of digital content collected.<br><br>Share your experiences of technology in school and beyond the classroom.<br><br>Talk about your work and make improvements to solutions based on feedback received.<br><br>Use a variety of software to manipulate and present digital content: data and information.<br><br>Create digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience<br><br>Undertake creative projects that collect, analyse, and evaluate data to meet the needs of a known user group.<br><br>Effectively design and create digital artefacts for a wider or remote audience.<br><br>make judgements about digital content when evaluating and repurposing it for a given audience.<br><br>Recognise the audience when designing and creating digital content.</td>
<td>Illustrate how bit patterns represent numbers, images and sound.<br><br>Examine how processors' instruction sets relate to low-level instructions carried out by a computer.<br><br>Model the relationship between binary and electrical circuits, including Boolean logic through the use of logic tables.<br><br>Consider the advances in technology and how these have an impact on the power of computers.<br><br>Analyse and evaluate data and information, and recognise that poor quality data leads to unreliable results, and inaccurate conclusions.</td></tr>
<tr><td><strong>NC links</strong><br><br>(where applicable)</td><td>A5, A6, A7, A9</td><td>A5, A6, A9</td><td>A1, A4, A6, A7</td></tr>
<tr><td><strong>Key Words</strong></td>
<td><strong>Tier 2 State, identify, annotate, predict, design</strong><br><br>Tier 3 Statement, iteration, loop, programming, algorithms, constant,</td>
<td><strong>Tier 2 Define, compare describe</strong><br><br>Safety, trusted, responsible, trust, search engine, internet, world wide web, password, username, manipulation, digital footprint, software, digital</td>
<td><strong>Tier 2 Suggest, interrupt, predict, justify, critique</strong><br><br>Character set, metadata, lossy, lossless, binary, decimal, hexadecimal, text, numbers, data, patterns, images, instructions, code.</td></tr>
<tr><td><strong>Homework</strong></td><td>Complete identified challenges previously set in homework booklet</td><td>Complete identified challenges previously set in homework booklet</td><td>Complete identified challenges previously set in homework booklet</td></tr>
<tr><td><strong>Career link</strong><br><br>(Unifrog)</td><td>Photonics engineer, quantitative analyst, software developer, app designer, programmer</td><td>e-safety advisor, IT support</td><td>Photonics engineer, quantitative analyst, software developer, app designer, programmer</td></tr>
<tr><td><strong>Employability skills</strong><br><br>(Highlight applicable)</td>
<td>Aiming high    Literacy<br>Creativity    Numeracy<br>Leadership    Independence<br>Listening    Communication<br>Presenting    Teamwork<br>Problem solving    Staying positive</td>
<td>Aiming high    Literacy<br>Creativity    Numeracy<br>Leadership    Independence<br>Listening    Communication<br>Presenting    Teamwork<br>Problem solving    Staying positive</td>
<td>Aiming high    Literacy<br>Creativity    Numeracy<br>Leadership    Independence<br>Listening    Communication<br>Presenting    Teamwork<br>Problem solving    Staying positive</td></tr>
<tr><td><strong>Common misconceptions</strong></td><td>Students may have previously incorrect taught knowledge from previous school. All students will</td><td>Students need recapping of how to work safely on computers. Ensuring they know who they can speak to if they have any issues.</td><td>Students get mixed up with Boolean logic, truth tables etc.</td></tr>
<tr><td><strong>Assessment</strong></td><td>Assessment of scratch game, followed by improvement after peer feedback.</td><td>Assessment of finished product of website and media products.</td><td>Complete identified assessment on Boolean logic.</td></tr>
<tr><td><strong>Notes / developments / standardisation comments</strong></td><td></td><td></td><td></td></tr>
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