Share Multi Academy Trust

Curriculum Plan

Subject:	**Computing**	**Year**	**9**	**Ability**	**All**

Term / Date(s)	**Topic 1 (8-10 Weeks)**	**Topic 2 (6-8 Weeks)**	**Topic 3 (3-5 Weeks)**	**Topic 4 (6-8 Weeks)**	**Topic 5 (6-8 Weeks)**
Topic	Phase 4 Programming: Python	E-Safety Cybersecurity Multimedia Interactive Learning Resource/App	Technology and the Environment	Computational Thinking: - Internal Components	Animation
Topic overview **Pupils will learn…**	In this unit, students will learn key programming design skills and how to turn a plan in to a working program using Python and common functions, variables, loops, inputs and outputs, building upon skills they have developed during Year 7 and 8.	In this unit, students will learn that Cybercrime is evolving at the same rate as the technology around us, that computer systems are at constant risk of intrusion, theft, and deletion, and that protection methods need to keep pace with the threats. Students will learn how to and develop a multimedia interactive system, that could be used as a tablet app.	In this unit, students will learn and understand the environmental damage technology has had on the environment over previous years and how technology is now being used to assist climate change and reduce the impact for future generations.	In this unit, students will learn about what hardware components are used to create all computers and how they fit together. They will also understand the difference between a basic system and a high end specification and why one type of computer might be needed over another.	In this unit, students will learn the fundamentals of how to create animations for different purposes, including web and entertainment.
Components	Students will learn and understand: • What algorithms are and how they can be represented as pseudocode and flowcharts. • How to output data from a program using the "Print" function. • How to use calculations within programs. • What variable are and how they are used within programs to store data. • How inputs can be used in programs to allow for user interaction. • How selection rules using IF ELIF and ELSE can be used to determine outcome from a program • How to loop sections of programs using FOR and WHILE and how this can benefit the functioning of a program.	Students will learn: • What Cybersecurity is in order to understand why it is needed and how different cyber threats faced by computer systems are designed to penetrate defences. • What protection methods are available to computer systems and how they are constantly being developed in order to understand how systems and networks try to guard against different cyber threats. • What makes an effective logo in order to create one and a series of navigation buttons using a range of software techniques. • How to create an interactive multimedia system, in order to create one using hyperlinks and buttons, adding and editing multimedia content including Text, Images, Video, Sound and Animation, including interactive features including Video controls, transitions and animation effects. • How to create original multimedia interactive activities in order to create things such as Quiz, Word search, Crossword, Spot the difference etc… for use within their system.	Students will learn: • How technology has had major impacts on the environment in order to understand how this impact can be both negative and positive: • That the waste caused by technological devices is known as e-waste in order to understand the impacts it is having on the environment around the globe. • What sustainability is in order to understand how we can reuse and recycle to make the most of the resources we have. • About the energy impacts made by technology in order to understand how technology demands more and more energy usage, but also how it is being used to create new energy production methods. • About technology is being used to monitor the environment in order to understand how this can then be used to try to stave off environmental change.	Students will learn: • What internal hardware components are used in all computer systems, from the motherboard, to the CPU, RAM and ROM, in order to understand their main purposes and characteristics. • About different storage media, in order to understand the differences between them and the reasons for choosing one over another. • That computers come in different ranges and that specifications are different for many reason in order to recommend a computer based upon a given scenario.	Students will learn: • What an animation is • Purposes of animation • How animation is used within entertainment • How animation is used online and within apps • How to create an animation using adobe • How to apply their animation to an app
Key knowledge	• Algorithms, flowcharts and pseudocode. • Common python functions (print, input, IF ELIF ELSE, FOR, WHILE) • Variables • Constructing programs from given scenarios.	• What is Cyber Security? • What cyber threats are being used to steal data and bring systems down? • What protection methods can be used to guard against cyber threats. • What makes and effective logo? • Multimedia skills: hyperlinks, buttons, master page, images, videos, transitions and effects.	• What negative impacts is technology having on the environment? • What positive impacts is technology having on the environment? • What is being done to reduce the negative impacts of technology?	• How do all computer systems work? • What are the main internal components of all computer systems? • What are the roles of common internal hardware components? • What different storage media is available? • Why would you choose one storage media over another?	• What is animation? • What are the different types of animation? • How is animation used in entertainment? • How is animation used online through the web and apps?
What pupils should already know (prior learning components)	In Key Stage 2, students should have been taught to: • Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve	In Key Stage 2, students should have been taught to: • 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,	In Key Stage 2, students should have been taught to: • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. • Select, use and combine a variety of software (including internet services) on a	In Key Stage 2, students should have been taught to: • 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.	In Key Stage 2, students should have been taught to: • Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve

	problems by decomposing them into smaller parts. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. In Year 7, students have worked with visual programming software (Scratch/Kodu) to create programs using the fundamentals of programming they will be working with in this Text based programming language. In Year 8, students have been introduced to text based Python programming, using Turtle. This builds upon that unit of work.	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. In Years 7 and 8, students have worked on a number of e-safety units, including social media and computer viruses.	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. In Year 7 and 8, students have continually been taught these skills during the different tasks and units covered throughout the year.	• Recognise common uses of information technology. This unit follows from work done in year 7 and 8, where students learnt about computer systems and networks.	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. In year 8, students were introduced to HTML fundamentals and the basics of web page development.
Transferrable knowledge (skills)	**Computing Theory** – Programming skills such as designing using pseudocode and flowcharts, writing using sequence, selection, repetition, variables inputs and outputs, and debugging including detecting errors, all transfer through to future programming units in years 9-11.	**Computing Theory** - What computer malware is, how they spread and the harm malware can do. How to prevent and remove malware. Types of malware (Virus, Trojan, worm, spyware, ransomware). **Digital Literacy** - Document layout skills including composition and effective use of whitespace. Text formatting skills including insert, resize, colour, emphasis, font style, spacing. Image formatting skills including insert, move, resize, remove, system Creation (multimedia – text, images, sound, animation, video; interactive – hyperlinks, buttons, transitions, animation effects). Document layout skills including composition and effective use of whitespace. Text formatting skills including insert, resize, colour, emphasis, font style, spacing. Image formatting skills including insert, move, resize, remove. This unit also links to Creative iMedia, Creating Interactive Multimedia. This unit also links to GCSE Computer Science (Systems Security)	Computing Theory – Understand the impacts technology has on the environment, including E-waste and Sustainability, 3 Rs (Reduce, Reuse & Recycle), Energy (Use and creation), Monitoring. Digital Literacy – Research (Choosing reliable information). Document layout skills including composition and effective use of whitespace. Text formatting skills including insert, resize, colour, emphasis, font style, spacing. Image formatting skills including insert, move, resize, remove.	**Computing Theory** – Computer systems, hardware, software. Input, process, output, storage. Internal components, CPU speed. **Digital Literacy** - Document layout skills including composition and effective use of whitespace. Text formatting skills including insert, resize, colour, emphasis, font style, spacing. Image formatting skills including insert, move, resize, remove	**Computing Theory** – Fundamentals of web design, using of HTML and tags. Use Web Authoring Software tools and techniques effectively to create web pages. **Digital Literacy** - Document layout skills including composition and effective use of whitespace. Text formatting skills including insert, resize, colour, emphasis, font style, spacing. Image formatting skills including insert, move, resize, remove background, colour. Web development tools, including text, images, galleries, sliders, marquees, Master pages.
Key vocabulary pupil will know and learn	Python, Sequence, Algorithm, Pseudocode, Print, Variable, Input, String, Integer, Function, brackets, Mathematical operators (+ - * /), If/Elif/Else, Logic operators (AND, OR, NOT, <>=), While Loop	Cyber Security, Hacker, Malware, Virus, Trojan, Worm, Spyware, Brute force, Denial of service, Data interception, SQL injection, Theft. Protection, User access rights, Passwords, Acceptable use policy, Backups, Anti-malware, Firewall, Encryption, Physical Security. Multimedia, Interactive, App, House Style, GUI, Accessibility, Logo, Hyperlinks, Buttons, Text, Images, Video, Sound, Animation, Video controls, transitions, Activities.	Green-IT, Energy, Data Centres, Monitoring, Ingenuity, Sustainability, Environmentally Friendly, Stakeholders, E-Waste, Land fill, Respect, Recycle-Reuse-Reduce, Responsibility, WEEE.	CPU, RAM, ROM, Motherboard, Fans, Hard Drive, Graphics Card, Sound Card, Network Interface Card, Optical Drive.	HTML, Web Browser, Tags
Assessment activities	Knowledge Assessment Python programs created during lessons	Knowledge Assessment Cyber Security Multimedia Interactive System	Starter and plenary mini assessments Use of online assessments (forms, Kahoot, quizizz) Information Poster	Information Graphic	Web Pages
Resources available	• Lesson Resources: I:\Maths and Computing\ICT\KS3\Year 9\9.1 Python Programming • Topic Checklist Book Sticker • SOW: I:\Maths and Computing\ICT\Curriculum • KS2 NC information - National Curriculum - Computing key stages 1 to 2 (publishing.service.gov.uk) • BBC Bitesize: ○ Introduction to Programming ○ Programming Basics ○ Selection in programming	• Lesson Resources: I:\Maths and Computing\ICT\KS3\Year 9\9.2 Cyber Security • Topic Checklist Book Sticker • SOW: I:\Maths and Computing\ICT\Curriculum • KS2 NC information - National Curriculum - Computing key stages 1 to 2 (publishing.service.gov.uk) • BBC Bitesize: ○ Viruses and Malware ○ Fundamentals of cyber security ○ Multimedia Applications	• Lesson Resources: I:\Maths and Computing\ICT\KS3\Year 9\8.3 Technology and Environment • Topic Checklist Book Sticker • SOW: I:\Maths and Computing\ICT\Curriculum • KS2 NC information - National Curriculum - Computing key stages 1 to 2 (publishing.service.gov.uk) • BBC Bitesize: ○ Ethics and Law ○ Ethical, legal and environmental impacts of digital technology •	• Lesson Resources: I:\Maths and Computing\ICT\KS3\Year 9\ 9.4 Parts of a Computer • Topic Checklist Book Sticker • SOW: I:\Maths and Computing\ICT\Curriculum • KS2 NC information - National Curriculum - Computing key stages 1 to 2 (publishing.service.gov.uk) • BBC Bitesize: ○ Technology through time	• Lesson Resources: I:\Maths and Computing\ICT\KS3\Year 8\ 9.5 HTML Programming • Topic Checklist Book Sticker • SOW: I:\Maths and Computing\ICT\Curriculum • KS2 NC information - National Curriculum - Computing key stages 1 to 2 (publishing.service.gov.uk) • BBC Bitesize: ○ Computer systems

Notes **Why this topic is important…**	Programming is a basic literacy in the digital age, and students need to understand and work with the technology around them. Learn programming prepares them for the future and can help with communication, creativity, math, writing, and confidence. As they learn to program, they learn that there is no one way to do something even if their way didn't work and can develop problem solving and resilience skills without worrying about failing.	Cyber security is important because it encompasses everything that relates to protecting our data from cyber attackers who want to steal this information and use it to cause harm. This can be sensitive data, governmental and industry information, personal information, personally identifiable information (PII), intellectual property, and protected health information (PHI). Multimedia programs are used by businesses to convey their message or product to an audience using a combination of images, animation, video and sound. Multimedia can be used for a variety of reasons such as product marketing, to educate, to entertain or a combination of purposes. As new technologies emerge, creativity is essential to capturing and keeping an audience's attention.	The use of computers has brought about ethical, legal and environmental impacts. These issues increasingly affect people's daily lives. It is important for students to have a good understanding of these impacts both on a positive and negative level.	Having a better understanding of how computers work allows students to determine the hows and whys of computer systems, which helps them become more effective in using the different hardware and software. Knowing about different computer systems makes it easy to understand their benefits and limitations, and their intended used. This helps students maintain realistic expectations about computers and attached devices and maximise their use.	As technology grows, so too does its use within business. Right now, there are hundreds of thousands of roles throughout Europe that require, at the very least, HTML skills. In fact, the world is going through a severe skills gap, and as a result, salaries are always growing for software developers who know and understand HTML.