Computing – Year 3/4 Cycle A

		Key Vocabulary
Autumn 1 Unit 1 Connecting computers	**Substantive Knowledge** • To know that digital devices work by accepting inputs, processing them, and producing outputs. • To know that input and output devices have different roles in how we interact with digital systems. • To know that computer networks connect devices and allow information to be shared across multiple connections. **Disciplinary Skills** • To classify and describe digital devices by their inputs, outputs, and purpose. • To compare digital and non-digital tools to explain how technology changes the way we work. • To demonstrate how information can be passed through a network and explain the function of network components (e.g. switch, server, wireless access point).	**Core** Digital device Input Output **Essential** Process. Network Connection **Desirable** Non-digital Switch (network Server Wireless Access Point Sockets / Cables
Autumn 2 Unit 2 **Stop-frame animation**	**Substantive Knowledge** • To know that animation is a sequence of images or frames that create the illusion of movement. • To know that small changes between frames are needed to make smooth animated motion. • To know that digital storyboarding helps to plan animations using characters, settings, and events. **Disciplinary Skills** • To create and review stop-frame animations using digital tools like onion skinning. • To improve animations by evaluating their own work and acting on peer feedback. • To enhance projects by adding media and explaining design choices.	**Core** Animation Frame Sequence **Essential** Flip book Image Photograph Setting Character **Desirable** Onion skinning Consistency Delete Media Transition

Spring 1 Unit 3 Programming A - Sequencing sounds	**Substantive Knowledge** • To know that sprites and backdrops in Scratch have attributes and can be controlled using commands. • To know that commands (blocks) have specific outcomes and must be sequenced correctly. • To know that a program needs a start and follows a set sequence to achieve a desired action or effect. **Disciplinary Skills** • To build a program by selecting and ordering blocks to control sprites and sounds. • To create projects from a design, making choices about appearance and behaviour. • To explain how code works, including predicting outcomes and matching actions to commands.	**Core** Programming Block Sprite **Essential** Command Sequence Event Algorithm Run the code **Desirable** Stage Costume Note / Chord Bug / Debug Design / Task
Spring 2 - Unit 4 Branching databases	**Substantive Knowledge** • To know that branching databases use yes/no questions to group and identify objects. • To know that attributes are features or characteristics (like colour or size) used to sort data. • To know that well-structured databases need carefully ordered questions to split data effectively and clearly. **Disciplinary Skills** • To create and test a branching database using yes/no questions based on object attributes. • To plan and build a structure that identifies objects accurately, including using a physical or digital format. • To evaluate and refine databases by comparing structures and discussing real-world applications.	**Core** Attribute Value Question **Essential** Table Branching database Group / Separate **Desirable** Equal / Even Compare / Order Structure Decision tree
Summer 1		**Core**

Unit 5 **Desktop publishing**	Substantive Knowledge • To know that text and images both communicate messages in different ways. • To know that layout and page orientation affect how information is presented and understood. • To know that desktop publishing helps organise content clearly for a specific purpose. Disciplinary Skills • To edit and format text and images by changing fonts, colours and layout. • To create a digital publication by choosing content and arranging it for a specific audience or purpose. • To evaluate layout and design choices, including comparing digital and hand-created work.	Text Image Layout **Essential** Font Style Orientation Placeholder Template **Desirable** Content Purpose Copy / Paste Advantages / Disadvantages Desktop publishing
Summer 2 Unit 6 Programming B – Events and actions in programs	Substantive Knowledge • To know that sprites respond to events (e.g. key presses) which make actions happen. • To know that commands can be put in order and extended to control movement and add features. • To know that debugging means finding and fixing mistakes in a program. Disciplinary Skills • To create and adapt a program by choosing suitable sprites, blocks and keys. • To improve a project by adding features, testing it and changing the code. • To design and evaluate a maze challenge, explaining choices and making improvements.	**Core** Sprite Motion Event **Essential** Action Debug / Error Algorithm Resize Set up **Desirable** Extension block Pen up / Pen Design Test Logic

Computing – Year 3/4 Cycle B

		Key Vocabulary

Autumn 1 Unit 1 **The internet**	**Substantive Knowledge** To understand that the internet is a network of networks. To understand how the World Wide Web works. To understand how content is created and shared online. **Disciplinary Skills** To explain why networks and online content need protecting. To evaluate the reliability of online information. To make responsible choices when sharing content.	**Core** internet network router website web page web address web browser World Wide Web links information content download **Essential** server wireless access point (WAP) security files sharing permission ownership accurate honest use adverts **Desirable** switch routing accurate content
Autumn 2 Unit 2 **Audio Production**	**Substantive Knowledge** To understand how sound can be recorded and played back using digital devices. To understand that audio recordings can be edited and combined. To understand how digital audio projects are saved and shared. **Disciplinary Skills** To plan and create purposeful audio content. To edit and refine audio independently. To evaluate and improve a podcast project.	**Core** audio sound microphone speaker headphones input device output device record playback save podcast

		Essential edit trim layer import export MP3 selection load evaluate feedback
		Desirable align
Spring 1 Unit 3 **Programming A** **Repetition in shapes**	**Substantive Knowledge** To understand that accuracy is important in programming To understand repetition in programming. To understand how programs are structured. **Disciplinary Skills** To design and write a program in a text-based language. To use and modify count-controlled loops effectively. To test, debug and improve a program.	**Core** Logo (programming environment) program turtle commands algorithm debug pattern repeat repetition
		Essential code snippet design count-controlled loop value trace procedure
		Desirable Decompose
Spring 2 - Unit 5	**Substantive Knowledge**	**Core** image digital

Photo Editing	To understand that digital images can be changed and edited. To understand that colour and effects can change meaning. To understand that images can be combined for a purpose. **Disciplinary Skills** To edit and improve images using software tools. To combine images to create a final project. To review and refine images based on feedback.	edit crop rotate save undo colours background foreground select zoom cut copy paste **Essential** adjustments effects hue saturation sepia vignette retouch combine alter font composite **Desirable** clone made up real
Summer 1 Unit 6 **Repetition in games**	**Substantive Knowledge** To understand repetition in programming. To understand that loops can run at the same time. To understand how code can be reused and modified. **Disciplinary Skills** To design programs using loops effectively. To create programs that follow a design. To evaluate and improve programs.	**Core** Scratch programming sprite blocks code loop repeat forever animate algorithm **Essential** value

		infinite loop count-controlled loop costume repetition event block duplicate modify debug
		Desirable design refine evaluate
Summer 2 Unit 4 **Data logging**	**Substantive Knowledge** To understand that data can be collected and recorded over time. To understand that data can be used to answer questions. To understand how computers help us analyse data. **Disciplinary Skills** To plan and collect data using digital tools. To analyse and interpret collected data. To evaluate and use data effectively.	**Core** data table input device sensor data point dataset collection
		Essential Layout logger logging interval logged analyse review
		Desirable import export conclusion

National Curriculum Statements

- Purpose of study
- A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.
- Aims
- The national curriculum for computing aims to ensure that all pupils:
  - ♣ can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
  - ♣ can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
  - ♣ can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
  - ♣ are responsible, competent, confident and creative users of information and communication technology.

Attainment targets
By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study. Schools are not required by law to teach the example content in [square brackets].

Computing – key stages 1 and 2

Subject content
Key stage 1
Pupils should be taught to:

♣ understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions

♣ create and debug simple programs

♣ use logical reasoning to predict the behaviour of simple programs

♣ use technology purposefully to create, organise, store, manipulate and retrieve digital content

♣ recognise common uses of information technology beyond school

♣ use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

Key stage 2
Pupils should be 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
- ♣ understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration
- ♣ use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- ♣ select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
- ♣ use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.