Computing – Year 5/6 Cycle A

		Key Vocabulary
Autumn 1 - Unit 1 **Systems and searching**	**Substantive Knowledge** To explain how computer systems are made up of connected parts To recognise the role and value of computer systems in daily life To understand how search engines work and why they are used **Disciplinary Skills** To identify and explain the parts and function of a digital system To analyse and evaluate search results To consider how and why search results are **ranked**	**Core** Selection Condition If....then... Outcome Program Algorithm **Essential** Else Flowchart Code Debug Loop Input Output **Desirable** Boolean Infinite loop Count-controlled loop Variable Selection structure Nested selection
Autumn 2 - Unit 2 **Video production**	**Substantive Knowledge** To understand what makes a video effective To know how video can be planned, recorded, and improved To know how digital devices are used to record and edit video **Disciplinary Skills** To explore and apply filming techniques for a given purpose To plan, create, and edit video content To evaluate the impact of video creation choices	**Core** Video Audio Camera Microphone Clio Edit Storyboard Filming **Essential** Talking head Close-up

		Mid-range Long shot Angle zoom Pan Tilt Static Moving subject import Split Trim Reshoot Export Review
		Desirable Lens Video camera Side by side Reorder Delete Evaluate share
Spring 1 - Unit 3 **Selection in physical computing**	**Substantive Knowledge** To understand how computers can control physical systems To know how different types of loops work in programming To understand that conditions affect how a program behaves **Disciplinary Skills** To write and test programs that use loops and selection To build and control physical computing systems To design, plan, and evaluate a physical computing project	**Core** Microcontroller Circuit Component Input Output Program
		Essential Crumble controller Usb Connection LED Motor Buzzer Switch Battery box

		Crocodile clips Connect Debug
		Desirable Sparkle Infinite loop Repetition Count-controlled loop Condition Selection action
Spring 2 - Unit 4 **Flat-file databases**	**Substantive Knowledge** To understand what a database is and how it organises information To know how to filter, sort, and group data to answer questions To understand how data can be presented visually **Disciplinary Skills** To create and manipulate databases to record and organise information To use search tools and filters to find answers in a database To ask and answer questions using data from real-world contexts	**Core** Database Data Information Record field
		Essential Sort Order Group Search Value criteria
		Desirable Graph Chart Axis Compare Filter presentation
Summer 1 - Unit 5 **Introduction to vector graphics**	**Substantive Knowledge** To understand how vector drawings are created using shapes and objects To know how tools and features affect the appearance of vector drawings To understand how vector drawings can be used for specific purposes **Disciplinary Skills**	**Core** Vector Vector drawing Drawing tools Object Move Resize

	To explore and experiment with digital drawing tools To create and edit vector drawings using layering and grouping To evaluate and reflect on the effectiveness of a vector drawing	Rotate Colour **Essential** Toolbar Duplicate / copy Paste Zoom Select Align Modify Layers Order **Desirable** Group Ungroup Reuse reflection
Summer 2 - Unit 6 **Selection in quizzes**	**Substantive Knowledge** To understand how selection works in computer programs To understand how selection affects program flow To know how to use algorithms to plan for selection **Disciplinary Skills** To design a program that uses selection effectively To create, test, and debug a program that uses selection To evaluate and improve a program that uses selection	**Core** Selection Condition True False Program Algorithm Input Outcome **Essential** Conditional statement Count-controlled loop Implement Test Run Debug design **Desirable** Question

		Answer Task Setup operator
E-Safety 1 lesson a term Year 5 unit	Substantive Knowledge • To know that strong passwords are important and understand what makes a password secure. • To know that communication can take place online in different ways. • To know that online activity can affect health and well-being, and that personal information can be found online. Disciplinary Skills • To create and evaluate strong passwords, explaining why some are more secure than others. • To search for and select simple information about a person online. • To identify unsafe online behaviour and explain who to report concerns to and how to stay safe.	**Core** online password strong password personal information bullying communication health well-being **Essential** app app permissions online communication mental health trusted adult positive contribution negative contribution **Desirable** biography in-app purchases summarise judgement advice

Computing – Year 5/6 Cycle B

		Key Vocabulary
Autumn 1 Communication & collaboration Year 6 units	**Substantive Knowledge** • To know how data is transferred on the internet • To know how the internet enables sharing and collaboration To know how to stay safe when communicating online **Disciplinary Knowledge**	**Core** • data • internet / Internet • public / private • one-way / two-way / one-to-one / one-to-many • collaboration

	• To identify and explain how the internet works • To use and compare online collaboration tools • To evaluate and apply safe online behaviour	**Essential** • address • protocol • Internet Protocol (IP) • Domain Name Server (DNS) • packet / header / data payload • chat • slide deck **Desirable** • explore • reuse • remix
Autumn 2 - Webpage creation Year 6 units	**Substantive Knowledge** • To know how websites are structured and created • To know how content is used and shared responsibly online • To know how data is transferred across the internet **Disciplinary Knowledge** • To plan and build web pages • To preview, test, and evaluate web content • To apply safe and responsible online practice	**Core** • website / web page • browser • media • logo • layout / header • home page / subpage • navigation / breadcrumb trail • hyperlink / external link / embed • purpose • copyright / fair use **Essential** • preview • evaluate • device • Google Sites **Desirable** • Hypertext Markup Language (HTML)
Spring 1 ***Variables in games***		**Core** • Variable

Year 6 units	Substantive Knowledge • To know that a variable is a named value that can change and store different types of data (e.g. numbers or text). • To know that variables are used to store and update information in a program. • To know that variables control how a program behaves (e.g. keeping score or tracking lives). Disciplinary Skills • To use variables in a program by setting, changing and using their values. • To design and create a simple game that uses variables. • To test, evaluate and improve a project, explaining choices and suggesting ways to extend it using variables. •	• Code • Algorithm • Event • Debug • evaluate **Essential** • Assign • Design • project **Desirable**
Spring 2 - Introduction to spreadsheets Year 6 units	Ooo yes, this is very solid upper KS2 content 👌 Just tightened the wording slightly so it's sharper and curriculum-ready for Year 5/6: Substantive Knowledge • To know that a spreadsheet organises and stores data in rows and columns. • To know that formulas can automatically calculate values from data in a spreadsheet. • To know that data can be presented in different ways (e.g. tables or charts) depending on purpose and audience.	**Core** • data • collecting • table / chart • spreadsheet / cell / cell reference • input / output • calculation **Essential** • structure / format / range / duplicate • comparison / results / evaluate • software / tools • propose / question **Desirable** • Formula

	Disciplinary Skills • To create and organise a data set in a spreadsheet, entering accurate data into appropriate cells. • To use formulas correctly to calculate values and solve problems (e.g. budgeting for an event). • To select and create appropriate ways to present data, such as charts or formatted tables, to communicate clearly.	• Data set
Summer 1 3D modelling Year 6 units	Substantive Knowledge • To know that digital models can be created and changed in three dimensions (x, y and z). • To know that 3D objects can be resized, rotated, recoloured and moved. • To know that complex 3D models are made by combining and grouping multiple objects for a purpose. Disciplinary Skills • To plan, design and create a 3D model for a specific purpose. • To analyse and evaluate a 3D model, identifying strengths and areas for improvement. • To refine and improve a digital model through testing and editing.	**Core** • 2D / 3D • select / move / rotate / resize / lift / lower • group / duplicate / combine • view / perspective / handles • recolour / hollow **Essential** • placeholder • choose / construct / modify • evaluate **Desirable** TinkerCAD
Summer 2 Sensing movement Year 6 units -	Substantive Knowledge • To know that programs can run on controllable devices using inputs and outputs. • To know that selection (if, then, else) controls a program using conditions. • To know that variables store data that can be changed and used to affect outcomes.	**Core** • Input / output • Process • Variable • Algorithm • Test • debug **Essential**

	Disciplinary Skills • To design an algorithm and program flow using inputs, outputs and variables. • To develop, test and transfer a program from an emulator to a controllable device. • To debug and refine a program by changing conditions, variables and sequences to improve it.	• If then else • Random • Sensing • navigation **Desirable** • Micro:Bit • MakeCode
E-Safety 1 lesson a term Year 6 unit	Substantive Knowledge • To know that online activity can affect emotions and well-being, and that issues such as bullying, scams or inappropriate content can cause harm. • To know that sharing online has positive and negative consequences, including effects on digital reputation and digital footprint. • To know how online security works, including password management, two-factor authentication, privacy settings and software updates. Disciplinary Skills • To discuss and evaluate online scenarios, identifying risks and suggesting safe responses, including how to get help. • To use strategies to stay secure online, such as managing passwords, adjusting privacy settings and capturing evidence of harmful behaviour. • To apply responsible decision-making when sharing online, including seeking consent and knowing what to do if information is compromised. •	**Core** password personal information online bullying consent privacy settings secure **Essential** digital footprint online reputation phishing scammers report **Desirable** two-factor authentication malware screenshot software updates

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.