Key Stage 3: Year 7 Computer Science

Overall Curriculum Goals

- To understand how to use The Blue Coat computer network and wider collaborative IT systems
- To understand the concept of algorithms
- To understand that a program is an implementation of an algorithm
- To understand and implement key programming concepts

Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Introduction to the network • Logging on changing PWD • Introduction to Files/folders • Network drives and locations • Navigating and uploading to Bloodle • Homework blocks • Email (CC, BB, Attach) • What is the internet? • Internet searches (simple and Boolean) • Downloading and saving files. **Staying safe online** • Dangers • How to report	**Simple programming** • Concept of hardware and software • BBC Micro: bit (programming) • Intro to Micro: bit • Intro to IDE • Understand imperative programming concept Understand and implement the following concepts: - • Strings • Variables • Sequence • Selection • Iteration	**Algorithms and Flow charts** • Understand the concept of an algorithm • Understand the difference between program and algorithm • Understand the concept of control system • Creating basic real-world algorithms e.g. on paper (getting ready for school, crossing road, making sandwich etc.) • Introduce Flowol software • Creating flowcharts for real life control systems using Flowol software (traffic lights, level crossing, automatic home, etc)	**HTML** • Introduction to coding • Difference between source code and view • Importance of accuracy • Introduction to HTML page layout and tags. **Mini Project** Mini Website project – mobile phone types/user needs, class survey, create chart in spreadsheet software. Save as image insert into website.	**Algorithms (searching and sorting)** • Introduction to abstract algorithms • What is an 'abstract algorithm?' • Example of searching in real life • Linear search • Examples of sorting in real life • Insertion sort • Bubble sort **Data representation** Binary Numbers - conversions	**Python Introduction** • What is a programming language? • Difference between Python and HTML • Python is an interpreted language and what it means • Understand source code and running a program • Intro to IDLE ide • Elegant coding conventions • Concepts covered: - Key concepts of turtle
Key Vocabulary/Concepts/Ideas	**Key Vocabulary/Concepts/Ideas**	**Key Vocabulary/Concepts/Ideas**	**Key Vocabulary/Concepts/Ideas**	**Key Vocabulary/Concepts/Ideas**	**Key Vocabulary/Concepts/Ideas**
Network, Folder, Directory, Save, Save As, left click, right click, downloads folder, file extension. Password, username, Bloodle, Upload, Drag and drop, Email, CC, BCC, Attachment, Privacy, Signature, Internet, Boolean (and/or) CEOP Safe Reliable Virus	Blocks IDE Strings Variables Sequence Selection Iteration Input, Output, Logic	Algorithm Flowchart Decision box Input Output Terminators Loop Process Stepwise refinement FLOWOL Control Routine Sub – Routine Repetition	TAGS - Heading, fonts, bold, images, hyperlinks, tables, colours, header, title, bold italic, underline and alignment. Format Styles	Searching Sorting Algorithms Bubble Sort Insertion Sort Linear Binary	Turtle Pen up, pen down, forward, left, right Variable IDLE IDE
CIAG	**CIAG**	**CIAG**	**CIAG**	**CIAG**	**CIAG**
	BEBRAS Challenge	**Alan Turing Cryptography Competition**	**Discussions re: web development roles and salaries.**		**Discussions re: programming careers and salaries.**

Key Stage 3: Year 8

Overall Curriculum Goals

- Understand cyber security threats, vulnerabilities and counter measures.
- Understand and be able to manipulate images
- Understand the content format model
- Understand and apply Turing complete programming concepts
- Be aware of cyber security threats and vulnerabilities

Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Cyber security • Research cyber security / legal ethical or social issue online. **Data representation** • Binary numbers • Binary shifts • Digital images	**Photoshop Skills** • Need to be able to manipulate image files. • Files from internet – links to HTML • Can be used in range of areas. • What is it? • What is it used for? • Why is it important? • Intro to GUI	**HTML website creation** • Pupils create website based on cyber security research earlier in year. • Document format model though using CSS alongside HTML. • Adding audio & video • Hyperlinks • Image hyperlinks • Defensive programming & validation	**Python Programming** • Development maintenance • Using repositories • Using bulletin boards • Producing maintainable code. • Strings • Comments • Variables & concatenation • Inputting data • Calculations	**Photoshop Skills** • Creating images for website • Understand Size & resolution • Scalability • Audience • Understand image file type • Understand transparency	**Python Programming** • String operations • Functions • Data types • Lists • Selection • Iteration • Abstraction
Key Vocabulary/Concepts/Ideas	**Key Vocabulary/Concepts/Ideas**	**Key Vocabulary/Concepts/Ideas**	**Key Vocabulary/Concepts/Ideas**	**Key Vocabulary/Concepts/Ideas**	**Key Vocabulary/Concepts/Ideas**
• Malware • Virus • Trojan • Worm • Social engineering – blagging, phishing, pharming, shouldering. • Copyright • Data Protection	• Concept of layers • Selection tools • Transform controls • Text • Image file types • Introduction to the software. • Basic tools and tips - Brightness and contrast, cropping, tone adjustment, colour	• DIV's • Sections • Backgrounds • Fonts • Colours • Tables • (un)ordered lists • hex colours	• Input • Output • Data types • Selection • Iteration • String handling/operations • Comments • Syntax • validation.	• Copyright • Format • Image • Font • Resolution • PPI • Scale • Audience • Layer • Transparency	• Lists, index, array, • Calculations operator, operand • String • Function (Argument and Parameter) • Return Type • Integer • Float • Boolean • For • While • If, elif, else. • Square brackets • Syntax • Abstraction
CIAG	**CIAG**	**CIAG**	**CIAG**	**CIAG**	**CIAG**
	BEBRAS Challenge	**NCSC Competition** **Alan Turing Cryptography Competition**	**Digital Advantage** **Girls Who Code**	**Digital:Her**	**Discussions re: programming careers and salaries.**

Key Stage 3: Year 9 Computer Science

Overall Curriculum Goals • Understand how data is represented in computers • Understand and apply structured programming concepts • Be aware of cyber security threats and vulnerabilities and how to mitigate them • Understand the hardware that makes up computers					
Half Term 1	**Half Term 2**	**Half Term 3**	**Half Term 4**	**Half Term 5**	**Half Term 6**
PRACTICAL PROGRAMMING TERM Data representation (binary/hex) Intense Python Formatting numbers Data types (int & float) Lists For Loops String handling Abstraction Decomposition	**PRACTICAL PROGRAMMING TERM** Data representation (sound / images) Intense Python continued. Functions Question loops File objects Dictionaries Dictionaries and REPLS Validation	**Adventure Game (in Python)** Synoptic element for KS3 Combining and consolidating all programming content learn to date by creating an adventure game comprising of all programming elements.	**Computer Systems** Computer Hardware Computer Software **Cyber Security** Threats Real life cases	**Legal, environmental and ethical** Hacking Cracking Wearable technologies Copyright Implants **Computer Networks** Types of network Topologies Protocols	**NEA programming practice – previous years' challenges.** Combining and consolidating all programming content learn throughout the year by competing a prior NEA.
Key Vocabulary/Concepts/Ideas	**Key Vocabulary/Concepts/Ideas**	**Key Vocabulary/Concepts/Ideas**	**Key Vocabulary/Concepts/Ideas**	**Key Vocabulary/Concepts/Ideas**	**Key Vocabulary/Concepts/Ideas**
• Bit • Byte • Binary • Hexadecimal • Iteration • String • Boolean • Integer • Float • Character • Abstraction • Decomposition	• Function • Return • Value • Flag • Read • Write • Dictionaries • Curly braces • Validation	• Structural programming • Modules • Interfaces • Global/local variables • Dictionary • Key value • User testing • Errors and exceptions • Syntax, logic, run time	• Memory • Motherboard • RAM • Secondary Storage • Primary storage • Registers • Processor • Cache • Cores • Clock speed • ALU	• Privacy • Hacking • Cracking • Implant • Topology • Bus • Star • WAN/PAN/LAN	As per previous programming sections.
CIAG	**CIAG**	**CIAG**	**CIAG**	**CIAG**	**CIAG**
	BEBRAS Challenge	**Alan Turing Cryptography Competition**			