The Grange Academy Computer Science curriculum map

Intent

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. Buildings on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Key Skills - Computer Science also ensures that pupils become digitally literate – driven, and express themselves and develop their ideas through identifying issues and problem solving at a level suitable for the future workplace and as active participants in a digital world.

Implementation

	Autumn Term I	Autumn Term II	Spring Term I	Spring Term II	Summer Term I	Summer Term II
Year 7	Unit 1: Understanding Computers - E-Safety - Elements of a Computer System - The CPU - Understanding binary - Convert Binary to Denary	Unit 1: Understanding Computers - ASCII - Binary addition - Storage devices - Revision	Unit 1: Understanding Computers - E-Safety - Elements of a Computer System - The CPU - Understanding binary - Convert Binary to Denary	Unit 1: Understanding Computers - ASCII - Binary addition - Storage devices - Revision	Unit 1: Understanding Computers - E-Safety - Elements of a Computer System - The CPU - Understanding binary - Convert Binary to Denary	Unit 1: Understanding Computers - ASCII - Binary addition - Storage devices
Year 8	Unit 1: Understanding Computers - E-Safety - Elements of a Computer System - The CPU - Understanding binary - Convert Binary to Denary - ASCII - Binary addition - Storage devices	Unit 2: Network - The internet - Connectivity - Topologies - Client-server networks - Encryption - Revision	Unit 1: Understanding Computers - E-Safety - Elements of a Computer System - The CPU - Understanding binary - Convert Binary to Denary - ASCII - Binary addition - Storage devices	Unit 2: Network - The internet - Connectivity - Topologies - Client-server networks - Encryption - Revision	Unit 1: Understanding Computers - E-Safety - Elements of a Computer System - The CPU - Understanding binary - Convert Binary to Denary - ASCII - Binary addition - Storage devices	Unit 2: Network - The internet - Connectivity - Topologies - Client-server networks - Encryption - Revision

	Flow Charts & Binary	Computer Systems & Legislations	Inside a Computer System	Programming 1	Programming 2	Programming 3
Year 9	This unit will cover an introduction to the core content that is covered in the Computer Science GCSE. Flow Charts Binary ● Flow charts ● Binary Code ● Pseudo Code ● Recalling Information ● Problem Solving ● Group work ● Organisation Students will have a topic test at the end of the half term. This will assess their knowledge of the topics they have learnt so far. This unit links to the GCSE in computer science. The content in this unit will help towards both component 1 - Computer Systems and component 2_Computational thinking, algorithms and programming.	This unit will cover an introduction to the core content that is covered in the Computer Science GCSE. Algorithms Hardware Software Ethics ● Problem Solving ● Pseudo Code ● Computer Parts & Components ● Recalling Information ● Networks ● Group work ● Organisation Students will have a topic test at the end of the half term. This will assess their knowledge of the topics they have learnt so far. This unit links to the GCSE in computer science. The content in this unit will help towards both component 1 - Computer Systems and	This unit will cover an introduction to the core content that is covered in the Computer Science GCSE. Networks Logic Gates Malware System Security Von Neumann ● Networks ● Internet ● Logic gates ● Calculations ● Malware ● Virus Protection ● Security ● Von Neumann ● Group Work ● Organisation Students will have a topic test at the end of the half term. This will assess their knowledge of the topics they have learnt so far. This unit links to the GCSE in computer science. The content in this unit will help towards both component 1 - Computer Systems and component	This unit will cover an introduction to the core content that is covered in the Computer Science GCSE. ROM & RAM Print/String Variables Selection ● Computer Systems ● ROM ● RAM ● Programming ● Writing Code ● Reading Code ● Writing Variables ● Using selection Students will have a topic test at the end of the half term. This will assess their knowledge of the topics they have learnt so far. This unit links to the GCSE in computer science. The content in this unit will help towards both component 1 -	This unit will cover an introduction to the core content that is covered in the Computer Science GCSE. Iteration User Input Lists File Handling ● Iteration ● Loops ● User input ● Programming ● Writing Code ● Reading code ● Writing and reading lists ● File handling Students will have a topic test at the end of the half term. This will assess their knowledge of the topics they have learnt so far. This unit links to the GCSE in computer science. The content in this unit will help towards both component 1 - Computer Systems and component	This unit will cover an introduction to the core content that is covered in the Computer Science GCSE. Subroutines String Manipulation Operators Casting Practical Python Challenge ● Subroutines ● Writing string ● Manipulating strings ● Operations ● Casting ● Programming ● Calculations ● Problem Solving Students will have a topic test at the end of the half term. This will assess their knowledge of the topics they have learnt so far. This unit links to the GCSE in computer science. The content in

		component 2_Computational thinking, algorithms and programming.	2_Computational thinking, algorithms and programming.	Computer Systems and component 2_Computational thinking, algorithms and programming.	2_Computational thinking, algorithms and programming.	this unit will help towards both component 1 - Computer Systems and component 2_Computational thinking, algorithms and programming.
Year 10	**2.4 Boolean logic 1.2.4 Data storage 2.1.1 Computational thinking** This topic will introduce to students how step by step instructions are needed. They will also learn about data storage and boolean logic. ● Boolean logic ● Storage ● Calculations ● Contextualise content ● Computational approach ● Clarify significant information ● Develop Computing Language skills ● Problem solving E **Component 1 - Computer Systems and component 2_Computational**	**1.2.4 Data storage 1.2.5 Compression 2.1.2 Designing, creating and refining algorithms** In this topic students will continue with their knowledge on data storage and also cover compression and how to design and create algorithms. ● Storage ● Compression ● Design ● Creating Algorithms ● Contextualise content ● Computational approach ● Clarify significant information ● Develop Computing Language skills ● Problem solving	**1.1.1 Architecture of the CPU 1.1.2 CPU Performance 2.2.2 Data types 2.2.1 Programming fundamentals** Students will be introduced to the architecture of the CPU and also look at the performance. Along with this they will look at different data types. They will also continue to build on programming fundamentals. ● CPU ● Performanc e of CPU ● Contextuali se content ● Computatio nal approach ● Clarify significant information ● Develop Computing Language skills ● Problem solving **Component 1 - Computer Systems and component 2** Computational thinking,	**1.1.3 Embedded systems 1.2.1 Primary storage (Memory) 1.2.2 Secondary storage 2.2.1 Programming fundamentals 2.2.3 Additional programming techniques** In this topic students will look at embedded systems along with primary and secondary storage.They will also continue to improve programming techniques. ● Systems ● Storage ● Memory ● Contextualise content ● Computational approach ● Clarify significant information ● Develop Computing Language skills ● Problem solving	**1.2.2 Secondary storage 1.3.1 Networks and topologies 2.2.3 Additional programming techniques** Students will continue to cover secondary storage and also look at network topologies. They will also continue to improve programming techniques. ● Storage ● Networking ● Contextualise content ● Computational approach ● Clarify significant information ● Develop Computing Language skills ● Problem solving **Component 1 - Computer Systems and component 2** Computational thinking, algorithms and programming	**1.3.1 Networks and topologies 1.3.2 Wired and wireless networks, protocols and layers** Students will look at network topologies and also cover wired and wireless networks. ● Networks ● Data ● Wired Connections ● Wireless Connections ● Contextualise content ● Computational approach ● Clarify significant information ● Develop Computing Language skills ● Problem solving **Component 1 - Computer Systems and component 2**

	thinking, algorithms and programming	**Component 1 - Computer Systems and component 2_**Computational thinking, algorithms and programming.	algorithms and programming.	**Component 1 - Computer Systems and component 2** Computational thinking, algorithms and programming.		Computational thinking, algorithms and programming.
Year 11	Content: J277 OCR - Component 2 2.1 Algorithms 2.2 Programming Fundamentals 2.3 Producing robust programs 2.4 Boolean logic	Content: J277 OCR - Component 2 2.5 Programming languages and integrated development environments **Practical Programming** All students must be given the opportunity to undertake a programming task(s), either to a specification or to solve a problem (or problems). Students may draw on some of the content in both components when engaged in Practical Programming.	Content: J277 OCR - Component 2 1.1 System Architecture 1.2 Memory and Storage 1.3 Computers networks, connections and protocols	Content: J277 OCR - Component 2 1.4 Network Security 1.5 System Software 1.6 Ethical, legal, environmental impacts of digital technology	Content: J277 OCR - Component 1 & 2 Component 1 revision Component 2 revision	Content: J277 OCR - Component 1 & 2 Exam term where students must practice their practical programming, component 1 and 2.