Curriculum Mapping Document
Computer Science

Linking our curriculum intention to our local community and real-life links to content:

The curriculum, through enrichment and real-life experiences during the school day and within enrichment opportunities, will maximise the use of the local area. We will link our curriculum to the following:

- Appreciate where ICT is used in the real world
- Recognise how ICT is used to benefit the local community and how ICT can be used to automate repetitive tasks
- How to remain safe when using ICT
- Respecting other people and their intellectual rights
- Working within the law
- Recognising different career paths within the ICT industry linking to the Gatsby Benchmarks
- By linking with local businesses, we explore career opportunities outside school
- Prepare students for using ICT for education

Year 7 Curriculum implementation

The Royal Society has identified three distinct strands within Computing, each of which is complementary to the others with each component being essential in preparing pupils to thrive in an increasingly digital world. Computer Science is the scientific and practical study of computation. The sequencing of lessons allows students to develop their knowledge as they progress through the year groups. In Year 7, we introduce programming to students at the start of the year by asking them to create webpages using HTML. By using the topic of internet safety, students are reminded how to use the internet safely. At the end of the year, we introduce visual programming using Scratch. Every industry uses computers so naturally computer scientists can work in any. Problems in science, engineering, health care, and so many other areas can be solved by computers. It's up to the computer scientist to figure out how and design the software to apply the solution.

Information Technology is concerned with how computers and telecommunications equipment work, and how they may be applied to the storage, retrieval, transmission and manipulation of data. In Year 7, we introduce the distinction between software and hardware and how these are used to effectively use computer systems.

Digital Literacy is the ability to effectively, responsibly, safely and critically navigate, evaluate and create digital artefacts using a range of digital technologies. In Year 7 we introduce the use of flat file databases in the form of an Excel spreadsheet in a business context. Building digital literacy means that students can look for employment in the media (broadcast engineer, multimedia broadcaster, sound technician) military (armed forces technical officer, intelligence officer, satellite technician) or finance (credit analyst, commodity broker, financial risk analyst).

1 – AUT A	2 – AUT B	3 – SPR A	4 – SPR B	5 – SUM A	6 – SUM B
EFFECTIVE & SAFE USE OF ICT SYSTEMS It is important that students understand how to use ICT effectively and safely. Building on what they have learnt at Primary school, the first thing we teach students at EWA is how to access the computer systems on site and remotely from home by developing an understanding of security and the different ways of securing a computer system. Students learn why passwords are important, how they can be generated and what makes a good password. Without this basic understanding of safety, students; and their personal data; are vulnerable to exploitation. We believe it is important to embed this understanding as soon as possible before they begin having access to mobile phones and social media accounts with limited monitoring. Throughout the year, we introduce students to the different functions of the	**EXPLORING WEB TECHNOLOGY** In this unit students develop their understanding of how the internet can be used and manipulated. By designing and creating a website of their own, students can better understand that, just because it is on the internet, it is not necessarily true. We allow students to develop their creativity by designing and building a website using text based and WYSIWYG editors. The students investigate websites and can identify common web furniture including external hyperlinks, images, animations, text, dynamic content and navigation systems. This unit provides students with a potential career path with some students continuing their education to produce websites for themselves, friends and family. Verbal feedback is used to ensure students are able to achieve success in the production phase. Live	**WHAT IS A COMPUTER?** In this unit students develop their understanding of what a computer is, how a computer works and recognise the common components that make up a computer system. Students will be able to identify different input and output devices and recognise a variety of computer systems and where they are used in everyday life. Pupils will be able to identify the purpose of a CPU and explain why it is important to computing speed. In understanding how computer systems work students can use the binary number system to represent different characters using ASCII coding. Verbal feedback is used to ensure students are able to achieve success in the production phase. Live marking will be used to accurately assess student performance in practical	**DATA & INFORMATION PROCESSING** In this unit students develop an understanding of data. They will be able to recognise the difference between data and information. Students will understand different data capture methods and be able to explain the benefits and drawbacks of each method. Once data is captured, students will be able to identify a suitable method of recording the data for processing using a flat-file database structure. Students will also be taught how the data within a flat-file database can be manipulated and processed using formulae, sorting and filters. Verbal feedback is used to ensure students are able to achieve success in the production phase. Live marking will be used to accurately assess student performance in practical tasks using the product rubric for guidance. Datamining is one of the biggest growing careers fields with research,	**ALGORITHMS** In KS2, students should have been exposed to basic algorithms. In this unit, we build upon this knowledge by modelling solutions to some common algorithms. Students can then develop their abilities further by applying computational thinking to decompose a given task, use abstraction to identify any repeated sequences and represent the final algorithm in a simple diagrammatic format of a flow chart. Verbal feedback is used to ensure students are able to achieve success in the production phase. Live marking will be used to accurately assess student performance in practical tasks using the product rubric for guidance. END POINT TEST & THERAPY Students will be able to breakdown a task into small steps and then present the algorithm in the form of a flow chart using the correct notation	**GAME DESIGN** In KS2, students should have been exposed to block coding using Scratch or MicroBit block builder. In this unit we build upon this knowledge by introducing game design theory and allowing the students to develop an idea into a fully working game. Student are introduced to storyboards and how these can be used to turn an idea into a reality. Students extend their game knowledge and software capabilities using triggers and consequences

computer system through a range of small projects focused around internet safety that develop their ability to use a variety of different software packages effectively. This also helps prepare them for using ICT across the curriculum for completing tasks in other subjects. Ethical, Legal and Environmental issues are explored to give students an understanding of how the use of ICT can impact on themselves and society. We look at Privacy & Security, Data Protection and the cost to the environment of making and using ICT hardware. END POINT TEST & THERAPY Verbal feedback is used to ensure students are able to achieve success in the production phase. Live marking will be used to accurately assess student performance in practical tasks.	marking will be used to accurately assess student performance in practical tasks using the product rubric for guidance. END POINT TEST & THERAPY Students create a website based on proposed design incorporating required elements and for additional credit, use CSS to change layout and colour schemes. A rubric will be used to inform students of their performance in the practical execution of the designed product allowing autonomous feedback on their current achievements and identify how to improve.	tasks using the product rubric for guidance. END POINT TEST & THERAPY Students can identify different input, output and peripheral devices. Students can explain how a CPU works.	analyst and engineering opportunities offering salaries ranging from 25k to 100k. END POINT TEST & THERAPY When given a block of data students can design and generate a flat-file data structure suitable for holding the data and allow sorting and filtering of the data to find specific information.	and symbols to represent and processes or decisions required in the solution.	to identify a winner. Verbal feedback is used to ensure students are able to achieve success in the production phase. Live marking will be used to accurately assess student performance in practical tasks using the product rubric for guidance. END POINT TEST & THERAPY The design is assessed to identify if the game is viable. Students develop their analytical skills by creating the game and then comparing the final version to the design to identify any differences.

Year 8 Curriculum implementation

Information Technology is concerned with how computers and telecommunications equipment work, and how they may be applied to the storage, retrieval, transmission and manipulation of data. In Year 8, we look at how ICT can be used in the real world.

Digital Literacy is the ability to effectively, responsibly, safely and critically navigate, evaluate and create digital artefacts using a range of digital technologies. ICT takes a broader approach and focuses on the way in which digital information is communicated. IT career opportunities are explored include, App developer, Graphic Design Software Development, Animation and Accounting.

1 – AUT A	2 – AUT B	3 – SPR A	4 – SPR B	5 – SUM A	6 – SUM B
WHAT IS A COMPUTER? In this unit students will realise the importance of finding, recording and selecting suitable information from a variety of sources to meet the requirements of a specific given task. Students will be able to identify how to validate the data they find and how to use the information to investigate where the raw materials are obtained and how computer components are manufactured and produce a **report** on the Fourth Industrial Revolution. Students will be able to select suitable pre-production design tools and industry standard documentation to design and create an effective **Podcast.**	**MOVIE MAKING** Studying filmmaking is valuable because it lets students be creative, tell compelling stories through visuals, and develop skills in storytelling, teamwork, and problem-solving. They will also gain technical expertise, understand global perspectives, and have opportunities for entrepreneurship. Studying filmmaking can open doors to various career paths and personal growth, making it a worthwhile and versatile pursuit. In essence, studying filmmaking offers a mix of creative and practical skills, fostering personal and professional growth, whether the students pursue a career in the film industry or apply the skills elsewhere. Students will be encouraged to think globally as the	**GRAPHICS** Students will learn about how graphics are created and the significance of image resolution. Students will be able to identify the correct file formats to use for producing graphics for a specific purpose or media. Students will develop an understanding of different graphics packages available and the importance of layout, white space, colour palettes and typography when creating a graphic for a given purpose. Produce a **book cover that meets the specific design brief** provided. Verbal feedback is used to ensure students are able to achieve success in the production phase. Live marking will be used to accurately assess student performance in practical	**ANIMATION** Students will learn how to plan and develop an idea using several types of software and tools together to meet the given design brief. Students will develop their skills in **animation software** using: Layers, Frames, Keyframes, Tween and Movement. Students will use criteria and feedback from others to improve my work and explain choices made in presenting information for different purposes and audiences. Verbal feedback is used to ensure students are able to achieve success in the production phase. Live marking will be used to accurately assess student performance in practical tasks using the product rubric for guidance.	**SPREADSHEETS** Students will learn how to use software effectively to produce a working spreadsheet using effective Formulae and Functions including IF statements, Conditional Formatting, Graphs and Charts, Sorting, Filters, Spinners, Modelling and "What if" statements Verbal feedback is used to ensure students are able to achieve success in the production phase. Live marking will be used to accurately assess student performance in practical tasks using the product rubric for guidance. END POINT TEST & THERAPY Each lesson students answer a series of hinge questions based upon the learning from the previous lesson allowing the teacher to check the	**MICROBIT PROGRAMMING** Following on from Year 7 modular programming with Scratch, this unit extends the students understanding by using the MicroBit to bring the programming from the screen into their hands. The students will generate several programs that demonstrate common programming techniques including selection, iteration, inputs and outputs. Verbal feedback is used to ensure students are able to achieve success in the production phase. Live marking will be used to accurately assess student performance in practical tasks using the product rubric for guidance. END POINT TEST & THERAPY Each lesson students answer a series of hinge

Verbal feedback is used to ensure students are able to achieve success in the production phase. Live marking will be used to accurately assess student performance in practical tasks using the product rubric for guidance. END POINT TEST & THERAPY Each lesson students answer a series of hinge questions based upon the learning from the previous lesson allowing the teacher to check the students understanding and repair any misconceptions. A rubric has been created for both projects that will allow students to measure their success in the different areas of design and execution of the challenges. In assessing the designs and final presented solutions, students' can use self and peer assessment to gauge their own progress and performance.	requirements of a student in England may be completely different to the requirements of a student in India. END POINT TEST & THERAPY Each lesson students answer a series of hinge questions based upon the learning from the previous lesson allowing the teacher to check the students understanding and repair any misconceptions. A rubric has been created for the project that will allow students to measure their success in the different areas of design and execution of the challenges. In assessing the designs and final presented solutions, students' can use self and peer assessment to gauge their own progress and performance.	tasks using the product rubric for guidance. END POINT TEST & THERAPY Each lesson students answer a series of hinge questions based upon the learning from the previous lesson allowing the teacher to check the students understanding and repair any misconceptions. A rubric has been created for the project that will allow students to measure their success in the different areas of design and execution of the challenges. In assessing the designs and final presented solutions, students' can use self and peer assessment to gauge their own progress and performance.	END POINT TEST & THERAPY Each lesson students answer a series of hinge questions based upon the learning from the previous lesson allowing the teacher to check the students understanding and repair any misconceptions. A rubric has been created for the project that will allow students to measure their success in the different areas of design and execution of the challenges. In assessing the designs and final presented solutions, students' can use self and peer assessment to gauge their own progress and performance.	students understanding and repair any misconceptions. A rubric has been created for the project that will allow students to measure their success in the different areas of design and execution of the challenges. In assessing the designs and final presented solutions, students' can use self and peer assessment to gauge their own progress and performance.	questions based upon the learning from the previous lesson allowing the teacher to check the students understanding and repair any misconceptions. A rubric has been created for the project that will allow students to measure their success in the different areas of design and execution of the challenges. In assessing the designs and final presented solutions, students' can use self and peer assessment to gauge their own progress and performance.

Year 9 Curriculum implementation

Computer Science is the scientific and practical study of computation. The sequencing of lessons allows students to develop their knowledge as they progress through the year groups. Programming skills are developed further in Year 9, where we introduce programming in Python; a high-level programming language and program documentation using flow charts and algorithms.

Information Technology is concerned with how computers and telecommunications equipment work, and how they may be applied to the storage, retrieval, transmission and manipulation of data. Year 9, we look further at software by looking at the features of operating systems and look further at the different types of input and output hardware.

Digital Literacy is the ability to effectively, responsibly, safely and critically navigate, evaluate and create digital artefacts using a range of digital technologies. In Year 9, we build on this knowledge by introducing Relational Databases and extend it further in KS4 by looking at sorting and filtering algorithms. The creation of digital artefacts is integral to much of the learning of Computing. Digital artefacts take many forms including digital images, computer programs, spreadsheets and animations.

1 – AUT A	2 – AUT B	3 – SPR A	4 – SPR B	5 – SUM A	6 – SUM B
BINARY Building on the **WHAT IS A COMPUTER?** unit from previous years, this unit allows students to develop their understanding of how binary numbers can be used to program computers, how we can communicate binary numbers easily using hexadecimal and how to convert a number between binary, hexadecimal and denary. We look at the limitations of ASCII and how the character s available can be increased using Unicode. Students develop an understanding of how computers generate and store graphics and sounds using bit patterns and bitmaps.	**HARDWARE / SOFTWARE** Building further on the **WHAT IS A COMPUTER** unit from previous years students develop an understanding of the functions of Operating Systems and how sensors can be used to automate input and output. Students are introduced to computer network topologies and develop an appreciation for design choices considering geographical location, planned expansion and financial limitations. END POINT TEST & THERAPY Based on given scenario, students can draw a network diagram to show the structure and	**DATA SECURITY** Building on the **EFFECTIVE & SAFE USE OF ICT SYSTEMS** unit from Year 7 students develop the skills to use data, information and images harvested from the information in an ethical manner considering the legal implications and ramifications should they fail to comply with legislation. Students are introduced to some of the other main laws that relate to computing: The Computer Misuse Act, The Data Protection Act and the Freedom of Information Act as well as GDPR regulations. In this unit students also look at the need for data	**RELATIONAL DATABASES** Building on the **DATA & INFORMATION PROCESSING** unit from Year 7 students develop an understanding of how data can be classified into different data types and the significance of choosing the right data type for storing information for manipulation, sorting and filtering. Students are introduced to Relational database structures and learn how these structures make it easier to work with large amounts of data. The benefits and drawbacks are explored and compared to the flat-file data structures they encountered in Year 7.	**EXTENDED ALGORITHMS** Building on the **ALGORITHMS** unit from Year 7 this unit looks at more complex algorithms and allows students to further develop their ability to draw solutions from scenarios. By modelling solutions to given scenarios students will be able to recognise how to break down (decompose) a problem into a series of steps (algorithm) whilst looking for any repeating sections (pattern recognition) that can be automated or simplified into a routine. As humans we are very adept at searching and sorting without paying much attention to how we complete the task. In this	**PYTHON PROGRAMMING** Building on the **GAME DESIGN** unit from Year 7 this unit looks at moving away from the block building form of coding and introduces text programming using Python. While coding and programming are very similar and the terms are often used together, there are some important differences between the two. Coding, in its simplest form, is the process of writing instructions. Programming is taking those instructions and making the target act according to them. Verbal feedback is used to ensure students are able to achieve success in the

Logic gates are introduced so that students can develop an understanding of how binary values can be changed depending on the logic circuit design. END POINT TEST & THERAPY Students will be able to correctly convert numbers between binary, denary and hexadecimal. Students can generate truth tables to track the binary values as data bits travel through a logic circuit. Students can map a sound wave into a digital representation and generate an image bitmap using bit patterns.	components of a data network with justification for their design choices.	backups and explore the different options available. END POINT TEST & THERAPY Based on given scenario, students can recognise the correct legal infringement and suggest ways to avoid prosecution. Students can identify the correct backup method for a given situation taking into account legal, ethical and financial considerations.	Verbal feedback is used to ensure students are able to achieve success in the production phase. Live marking will be used to accurately assess student performance in practical tasks using the product rubric for guidance. END POINT TEST & THERAPY Students will be able to generate basic queries using SQL and database tools to link the data between tables. Students can generate reports to present the information to the user based on sorting and filters generated in the queries.	unit students will gain an understanding of the different methods that can be employed to search for an item in a given list and what a computer needs to know to put a list into some form of order Verbal feedback is used to ensure students are able to achieve success in the production phase. Live marking will be used to accurately assess student performance in practical tasks using the product rubric for guidance. END POINT TEST & THERAPY Students will be able to breakdown a task into small steps and then present the algorithm in the form of a flow chart using the correct notation and symbols to represent and processes or decisions required in the solution.	production phase. Live marking will be used to accurately assess student performance in practical tasks using the product rubric for guidance. END POINT TEST & THERAPY Students will be able to generate a computer program that correctly performs the required function.

Year 10 Curriculum implementation

In Year 10, we further develop Computer Science ability by looking at the skills students will need beyond school and focus on career skills as well as academic knowledge. We focus on the three main careers areas relating to computing. Computer Programming, Networks and Network Security and Data Management.

By providing students with a knowledge of the industry-standard, Systems Development Life Cycle methodology, students can appreciate how software is developed in the real world. By improving their programming design abilities and their coding skills students will be able to move on to college or work with confidence. Students are taught about the different network architectures and topologies that currently exist and the myriad of protocols that run on the different network layers available so that they can develop knowledge and skills that will allow them to study this topic further and build on the skills they will need to succeed in this field of computing. In the world we live in data plays a large part in our everyday lives from Online Shopping; tracking what we buy, how much we spend and where we shop to Wearable technology; tracking our steps and recording our movements. Having the skills to harvest, store and manipulate data is a useful skill in today's career marketplace. We provide students with an understanding of this career field so that they can choose to develop their skills in this area further through college or employment.

1 – AUT A	2 – AUT B	3 – SPR A	4 – SPR B	5 – SUM A	6 – SUM B
In this unit students can develop their programming skills further by applying the theoretical knowledge gained in previous years to providing actual solutions to given programming challenges. Students will be able to decompose a task to generate a suitable algorithm. They will then be able to refine the algorithm using abstraction to create a flow charts to represent the algorithm. Revision activities: number representation. Binary to Hex conversions. Denary to Binary conversions. Understand how computers are used to create and store data using ASCII and Unicode. Be able to calculate file sizes for images and	In this unit students investigate the different method of searching and sorting using programming logic. They will be able to compare the different options and select the right method for given scenarios based on expected results and efficiency. Students will be able to understand data structures and manipulate data based on selective criteria. Students will develop a further appreciation of how programs can go wrong and be able to distinguish between different error types. END POINT TEST & THERAPY	In this unit students can further develop their understanding of computer functionality by applying the theoretical knowledge gained in previous years to specific functions such as storing and displaying sounds and graphics. Students will know the impact storage has on the overall performance of a program and the computer system. Students will be able to understand further how computers can compress data using Huffman coding and Run Length Encryption. By understanding Boolean logic further, students will be able to understand how a computer processes the binary data it receives and	In this unit students can further develop their understanding of software. Being able to identify Application and System Software, recognising the functions performed by the Operating System and how programs need to be converted for machine processing using Translators, Compilers or Assemblers. Students will extend their knowledge of computing hardware and develop an appreciation for the different system architectures available. The importance of correct Hardware selection will be taught relating to cost, performance and functionality. Storage needs and the different methods of	Based upon knowledge from previous years students will be able to discuss the advantages and disadvantages of computer networks relating to network type, topology and connectivity. Students will learn the term network protocol and be able to explain the purpose and use of common network protocols. Students will learn the functions and protocols associated with each of the layers in the TCP/IP model. Network security will be covered with students able to explain different methods of network security and the associated exploits they are designed to protect against.	In this unit students will develop further their knowledge and understanding of Relational Databases. Students will be able to recognise logical links between data and be able to use normalisation tools to create data tables and generate logical links between the data. Students will be able to interrogate a data structure using Structured Query Language. SQL is the standard language for relational database management systems and allows a student to search, sort and filter data using programming tools. END POINT TEST & THERAPY

sound files. Be able to represent images using binary code and convert sound waves into binary data. Revision END POINT TEST & THERAPY A rubric has been created for each programming task that will allow students to measure their success in the different areas of design and execution of the mini program challenges. In assessing the presented solutions, students' can monitor their own progress and assess their own performance.	Exam style questions will be completed at the end of this unit to ensure all students know all the required materials.	manipulates that data to perform tasks. END POINT TEST & THERAPY Students will be able to correctly draw logic circuit diagrams and truth tables for given Boolean logic equations. Exam style questions will be completed at the end of this unit to ensure all students know all the required materials.	storing data both locally and remotely will be studied so that students are aware of the legal and ethical requirements relating to personal data and it's processing relating to Cloud Storage. END POINT TEST & THERAPY Exam style questions will be completed at the end of this unit to ensure all students know all the required materials.	END POINT TEST & THERAPY Exam style questions will be completed at the end of this unit to ensure all students know all the required materials.	Exam style questions will be completed at the end of this unit to ensure all students know all the required materials.

Year 11 Curriculum implementation In Year 11, we further develop Computer Science ability by looking at the skills students will need beyond school and focus on career skills as well as academic knowledge. We focus on the cyber security and look at the impact ICT and computing has on society by considering the health, social, economic and legal issues that arise from the deployment, use and disposal of computer systems and the data they contain.					
1 – AUT A	**2 – AUT B**	**3 – SPR A**	**4 – SPR B**	**5 – SUM A**	**6 – SUM B**
In this unit students can develop their programming skills further by applying the theoretical knowledge gained in previous years to providing actual solutions to given programming challenges. Students will be able to decompose a task to generate a suitable algorithm. They will then be able to refine the algorithm using abstraction to create a flow charts to represent the algorithm. Students are introduced to Cyber Security. END POINT TEST & THERAPY A rubric has been created for each programming task that will allow students to measure their success in the different areas of design and execution of the mini program challenges. In assessing the presented solutions, students' can monitor their own	Students continue their study of Cyber Security where they are introduced to social engineering and the methods that can be employed to protect a computer system, network and the data contained within. In this unit students also develop an understanding of the social, legal and ethical problems that exist within the realms of computing. From the rights and responsibilities of storing and processing data to the issues surrounding the disposal of legacy hardware equipment. END POINT TEST & THERAPY Exam style questions will be completed at the end of this unit to ensure all students know all the required materials.	It is important that students can retain the information that they have been taught. Students will revisit the importance of binary numbers and their significance in computing. Looking at how data can be processed using binary additions and binary shifts as well as recognising the orders of magnitude and their respective titles and symbolic reference. We will revisit how data is stored and presented for Graphics and Sound with compression techniques such as Huffman Coding and RLE. Boolean Logic is also revisited ensuring students understand thoroughly Algebraic equations, Truth Tables and Circuit Diagrams END POINT TEST & THERAPY Exam style questions will be completed at the end of this unit to ensure all students know all the required materials.	In this unit we will look at the different types of software and how it can be written by humans and interpreted by computers to perform specific tasks. We will revisit the performance and functionality of a computer system looking at the input, output and peripherals available. We will study the hardware configuration of the Von Neumann architecture for a CPU and recap the different functions of the operating system. END POINT TEST & THERAPY Exam style questions will be completed at the end of this unit to ensure all students know all the required materials.	In tis unit we will revisit some of the common programming skills required such as the use of variables, data types, function calls and structure. We will ensure that students are able to read and write to and from external data files. Students will be able to describe and evaluate sort methods such as a bubble sort or a merge sort. Students will be able to describe and evaluate search methods such as a linear search or a binary search. END POINT TEST & THERAPY Exam style questions will be completed at the end of this unit to ensure all students know all the required materials.	

progress and assess their own performance.					