Computing Curriculum Intent

Department Philosophy: WHSG Computing department's approach to the curriculum is to develop an understanding of the importance of computing and its impact on the world. We want our students to have skills for life. The curriculum is an integrated and holistic approach that will equip our students with the tools necessary to appreciate the implementation of computational technology to the current world and its future developments. It will encourage and develop a safe and confident approach to Computing and ICT. The curriculum design aims to maximise opportunities. Our intention is to allow our students to value the application of Computing as a major part of life and its influence on real-life decisions thus being able question the moral, ethical and human effects of this on society. We also recognise the wider interests of students and therefore facilitate the appropriate use of Computer devices both in school and at home.

By the end of Key Stage 3 our students will know:	By the end of Key Stage 4 our students will know:	By the end of Key Stage 5 our students will know:
1. *How the impact of computational devices will affect their way of life now and in the future* 2. *How to use software across different subject areas effectively both in school and at home* 3. *How to problem solve and use the tools available to produce an appropriate solution* 4. *Be able to identify key features of a computer and its' function* 5. *How a basic computer system works regardless of whether it is portable or desktop* 6. *How to code in three different languages and understand how they can be utilised for different needs along with the language specific programming concepts including number bases* 7. *The cost to society both morally and ethically by the development of computational devices* 8. *Key terminology associated with computing and their meanings* 9. *How to use computational devices safely and the potential dangers and risks present both online and physically through prolonged use*	10. *Fundamentals of algorithms - How to design algorithms using key computer science techniques such as abstraction and decomposition. They should be aware of the efficiency of algorithms and the different types of algorithms used to search and sort data.* 11. *Programming – the concept of data types and be able to understand and use these appropriately. They should be aware of different programming concepts including (nested) selection, iteration and subroutines and high level and low level languages* 12. *Fundamentals of data representation – to understand the use of number bases and manipulation of binary and conversions. They should be aware of character encoding and the uses for these including image and sound representation along with data compression its' need.* 13. *Computer systems - to understand hardware and software and the use for Boolean logic. To understand the concept of system architecture and the type of software classification* 14. *Fundamentals of computer networks – to be aware of the how networks function and can send receive data efficiently and how they are set up* 15. *Fundamentals of cyber security – to understand the different types of encryption and the necessity of these more so as technology is changing* 16. *Ethical, legal and environmental impacts of digital technology on wider society, including issues of privacy* 17. *Aspects of software development – design and implementation of programming* 18. *Programming project - students will develop their skills in coding and apply the techniques learnt in previous sessions*	19. *Fundamentals of programming – how to design and implement programming techniques to solve real world problems in order to produce high end solutions* 20. *Fundamentals of data structures – to understand how to produce effective software using efficient programming techniques and the relationship of data management* 21. *Fundamentals of algorithms - How to design algorithms using key computer science techniques such as abstraction and decomposition. They should be aware of the efficiency of algorithms at a more in depth level* 22. *Theory of computation – how to develop solutions to simple logic problems and use techniques to trace through programs to test their functionality. To understand in depth theory of abstraction and computational solutions to determine whether they are in/tractable* 23. *Fundamentals of data representation – how to utilise the different number systems and their application to problem solving. To understand how this can be applied to images and sound.* 24. *Fundamentals of computer systems – how hardware and software function and discover an in-depth knowledge of the functionality of how computational devices actually work.* 25. *Fundamentals of computer organisation and architecture – the design of a computer system and why they differ including the internal workings of the CPU* 26. *Consequences of uses of computing – explore the individual (moral), social (ethical), legal and*

		cultural issues and opportunities and applying this to current usage of technology *27. Fundamentals of communication and networking – define and understand the role of communication methods and the application of these in networks.* *28. Fundamentals of databases – how design and create different types of database involving multiple entities including the use of SQL.* *29. Big Data – what big data is and what this means for data manipulation and structure when there is too much volume, velocity and variety of data. How can we deal with this problem?* *30. Fundamentals of functional programming - to understand its uses and how to interpret and write functional language programs. In addition, the application of Haskell and OOP* *31. Systematic approach to problem solving – understand the approaches utilised to create solutions using analysis, design, implementation and testing techniques.* *32. Non-exam assessment - the computing practical project -The project allows students to develop their practical skills in the context of solving a realistic problem or carrying out an investigation. The project is intended to be as much a learning experience as a method of assessment;*