A level Computer Science

MAGHULL HIGH SCHOOL – CURRICULUM MAP

HALF TERM 2.1 Jan - Feb	**Week 16**	**Week 17 – 18**	**Week 18**	**Week 19-21**
TOPIC (S)	Project	2.7 Computational methods	Project	2.8 Algorithms
Knowledge & Skills development	Students will independently work on their project – development stage	What are computational methods? What is divide and conquer? What is backtracking? What is data mining and how can it be used to discover new trends? What are heuristics? What is performance modelling? What is pipelining in the context of programming? How can visualisation be used to help solve a problem?	Students will independently work on their project – development stage	How does the bubble sort work? How does the insertion sort work? How does the linear search work? How does the binary search work? How do stacks and queues work? How is Big O notation used to describe the complexity of algorithms? Which data structures and their operations are used for common algorithms? How does a merge sort work? How does a quicksort work? How does Dijkstra's shortest path algorithm work? How does the A* algorithm work?
Assessment / Feedback Opportunities	Questioning pupils – verbal feedback	Classroom activity - Class Discussion - Questioning pupils – verbal feedback – exam questions	Questioning pupils – verbal feedback	Classroom activity - Class Discussion - Questioning pupils – verbal feedback – exam questions
Cultural Capital	Problem solving Impact of technology on the world			
SMSC / Promoting British Values (Democracy, Liberty, Rule of Law, Tolerance & Respect)	• Listening to others • Responding suitable in discussions • Taking part in group activates			
Reading opportunities	Instructional Reading Key word Identification Structure and Interpretation of Computer Programs Design Patterns: Elements of Reusable Object-Oriented Software			

Key Vocabulary	Computational methods, Problem recognition, Problem decomposition, Divide and conquer, Backtracking, Data mining, Heuristics, Performance modelling, Visualisation	Algorithm, Big O notation, Bubble sort, Insertion sort, Merge sort, Quicksort, Dijkstra's shortest path, A* algorithm, Binary search, Linear search
Digital Literacy	Use of technology Understanding of how technology works	
Careers	Software Engineer – Cyber Security – Multimedia programmer – Systems analyst – Games developer	