Maths- Y12

MAGHULL HIGH SCHOOL – CURRICULUM MAP

HALF TERM 2 Nov - Dec	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
TOPIC (S):-Pure **:-Statistics** **:-Mechanics**	**Differentiation** **Probability and Statistical Distributions** **Kinematics in one dimension**	**Differentiation** **Probability and Statistical Distributions** **Kinematics in one dimension**	**Differentiation** **Probability and Statistical Distributions** **Kinematics in one dimension**	**Differentiation & Integration** **Probability and Statistical Distributions** **Kinematics in one dimension**	**Integration** **Probability and Statistical Distributions** **Kinematics in one dimension**	**Integration** **Probability and Statistical Distributions** **Kinematics in one dimension**	Revision and Test for all modules.
Knowledge & Skills development	Pure Statistics	**Differentiation:** Understand and use the derivative of f(x) as the gradient of the tangent to the graph of y = f(x) at a general point (x, y); the gradient of the tangent as a limit; interpretation as a rate of change. Differentiation from first principles for small positive integer powers of x. Differentiate ax^n, for rational values of n, and related constant multiples, sums and differences. Understand, interpret and extract information from diagrams to solve problems. Use a mathematical model with suitable inputs to engage with and explore situations. Understand Differentiation as a rate of change and use the second derivative as the rate of change of gradient. Apply differentiation to find gradients, tangents and normals, maxima and minima and stationary points, points of inflexion. Identify where functions are increasing or decreasing. I**ntegration**: Understand and use mathematical language and syntax as set out in the glossary. Know and use the Fundamental Theorem of Calculus. Integrate x^n (excluding n = –1), and related sums, differences and constant multiples. Evaluate definite integrals; use a definite integral to find the area under a curve **Probability and Statistical Distributions:** Understand and use mutually exclusive and independent events when calculating probabilities. Link to discrete and continuous distributions. Interpret diagrams for probability distributions. Understand and use simple, discrete probability distributions (calculation of mean and variance of discrete random variables is excluded). Understand and use modelling assumptions and evaluate whether the model is appropriate. Use of functions in modelling, including consideration of limitations and refinements of the models. Understand and use the binomial distribution, as a model; calculate probabilities using the binomial distribution. Understand and apply the language of statistical hypothesis testing, developed through a binomial model: null hypothesis, alternative hypothesis, significance level, test statistic, 1-tail test, 2-tail test, critical value, critical region, acceptance region. Conduct a statistical hypothesis test for the proportion in the binomial distribution and interpret the results in context. Understand that a sample is being used to make an inference about the population and appreciate that the significance level is the probability of incorrectly rejecting the null hypothesis.					

	Mechanics	**Kinematics in one dimension:** Understand and use fundamental quantities and units in the S.I. system: length, time, mass. Understand and use derived quantities and units: velocity, acceleration, force, weight. Understand, interpret and extract information from diagrams and construct mathematical diagrams to solve problems, including in mechanics. Translate a situation in context into a mathematical model, making simplifying assumptions. Understand that a mathematical model can be refined by considering its outputs and simplifying assumptions. Understand and use modelling assumptions. Understand and use the language of kinematics: position; displacement; distance travelled; velocity; speed; acceleration. Understand, use and interpret graphs in kinematics for motion in a straight line: displacement against time and interpretation of gradient; velocity against time and interpretation of gradient and area under the graph. Evaluate, including by making reasoned estimates, the limitations of solutions. Use a mathematical model with suitable inputs to engage with and explore situations (for a given model or a model constructed or selected by the student). Interpret the outputs of a mathematical model in the context of the original situation (for a given model or a model constructed or selected by the student). Understand that a mathematical model can be refined by considering its outputs and simplifying assumptions. Understand, use and derive the formulae for constant acceleration for motion in a straight line. Use a mathematical model with suitable inputs to engage with and explore situations (for a given model or a model constructed or selected by the student). Interpret the outputs of a mathematical model in the context of the original situation (for a given model or a model constructed or selected by the student). Use calculus in kinematics for motion in a straight line: $v = dr/dt$, $a = dv/dt$, $r = \int v\,dt$, $a = \int v\,dt$.					
Assessment / Feedback Opportunities		Topic assessments	Self-assessment sheets	Homework	Formative teacher assessment - verbal	Retrieval practice	
Cultural Capital		• Tolerance and respect for peers and mathematicians • Democracy: allowing all to speak and voice views					
SMSC / Promoting British Values **(Democracy, Liberty, Rule of Law, Tolerance & Respect)**		Willingness to participate in, and respond to mathematical opportunities. Use of social skills in different contexts, including working and socialising with pupils from different religious, ethnic and socio-economic backgrounds.					
Reading opportunities		• Fermat's Last Theorem • History of computer programming • History of Florence Nightingale					
Key Vocabulary		Differentiate, Calculus, Integrate, tangents, normals, maxima, minima, mutually exclusive, binomial distribution, kinematics.					
Digital Literacy		Autograph, Desmos for graphing. Geogebra.					
Careers		Architect, Sports science, Engineer, Statistician, Business- manager, Market research. Computer Programmer, Video game development.					

Maths- Y12

MAGHULL HIGH SCHOOL – CURRICULUM MAP

HALF TERM 2 NOV - DEC	Week 1	Week 2	Week 3	Week 4 and 5	Week 6	Week 7
TOPIC (S)						

Knowledge & Skills development	•					
Assessment / Feedback Opportunities	Topic assessments	Self-assessment sheets	Homework	Formative teacher assessment - verbal	Retrieval practice	
Cultural Capital	•					
SMSC / Promoting British Values (Democracy, Liberty, Rule of Law, Tolerance & Respect)	• •					
Reading opportunities	•					
Key Vocabulary						
Digital Literacy						
Careers						

Maths- Y12

MAGHULL HIGH SCHOOL – CURRICULUM MAP

HALF TERM 3 JAN - FEB	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6

TOPIC (S)	ASSESSMENT review	Inequalities	Vectors	Vectors	Sine and Cosine rules	Sine and Cosine rules
Knowledge & Skills development	•					
Assessment / Feedback Opportunities	Topic assessments	Self-assessment sheets	Homework	Formative teacher assessment - verbal	Retrieval practice	
Cultural Capital	•					
SMSC / Promoting British Values (Democracy, Liberty, Rule of Law, Tolerance & Respect)	• •					
Reading opportunities	•					
Key Vocabulary						
Digital Literacy						
Careers						

Maths- Y12

HALF TERM 4 FEB - APR	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
TOPIC (S)						
Knowledge & Skills development	•					
Assessment / Feedback Opportunities	Topic assessments	Self-assessment sheets	Homework	Formative teacher assessment - verbal	Retrieval practice	
Cultural Capital	•					
SMSC / Promoting British Values (Democracy, Liberty, Rule of Law, Tolerance & Respect)	• •					
Reading opportunities	•					
Key Vocabulary						
Digital Literacy						
Careers						

Maths- Y12

HALF TERM 5 APR - MAY	Week 1	Week 2	Week 3	GCSE exams		
TOPIC (S)						
Knowledge & Skills development	•					
Assessment / Feedback Opportunities	Topic assessments	Self-assessment sheets	Homework	Formative teacher assessment - verbal	Retrieval practice	
Cultural Capital	•					
SMSC / Promoting British Values **(Democracy, Liberty, Rule of Law, Tolerance & Respect)**	• •					
Reading opportunities	•					
Key Vocabulary						
Digital Literacy						
Careers						

Maths- Y12

HALF TERM 6 JUN - JUL	Week 1	Week 2	Week 3	Week 4	Week 5 and 6	Week 7
TOPIC (S)						
Knowledge & Skills development	•					
Assessment / Feedback Opportunities	Topic assessments	Self-assessment sheets	Homework	Formative teacher assessment - verbal	Retrieval practice	
Cultural Capital	•					
SMSC / Promoting British Values **(Democracy, Liberty, Rule of Law, Tolerance & Respect)**	• •					
Reading opportunities	•					
Key Vocabulary						
Digital Literacy						
Careers						