Mathematics – Age Related Milestones Year 9

QUEEN'S PARK HIGH SCHOOL

Handling data	Working Towards (FOUNDATION GCSE)	SOW	Meeting (FOUNDATION/HIGHER GCSE)	SOW	Exceeding (HIGHER)	SOW
Processing data	Construct graphs using discrete, continuous and grouped data Construct tables Draw scatter graphs for bivariate data	F-T2- U3 F-T2- U3	Construct tables, charts and diagrams. Know their appropriate use Draw line of best fit and make predictions	F-T2-U3 F-T2-U3	Construct Histograms Draw Time series graphs Extend to calculate Quartiles and IQR	H-T2-U3
Analysing Data	x		Interpret, analyse and compare the distributions of data sets through Graphs and MMMR Interpret scatter diagrams. Recognise correlation	F-T2 -U3 F-T2 -U3	Interpret data using quartiles and IQR Compare mean and range of 2 distributions Interpret time series graphs Develop deeper interpretation of correlation	H-T2-U3
Communication	Use of appropriate Vocabulary		Vocabulary – correlation Explain and discuss what data/graphs are saying Link explanations and predictions to graphical information such as lines of best fit		Explain the appropriateness of each technique Vocabulary – interpolation, extrapolation	
Algebra	**Working Towards**	**SOW**	**Meeting**	**SOW**	**Exceeding**	
Manipulation	Use notation correctly Identify expression/equation/formula/identity Manipulate an d simplify algebraic expressions (collecting 'like' terms) Multiply terms together Simplify expressions by cancelling Use basic index notation	F-T1-U2	Use index laws and notation in algebra Expanding single brackets Factorising single brackets Expand and simplify brackets Expanding products of 2 brackets Factorising quadratic expressions in the form x^2+bx+c Know difference between equation and identity Substitute numbers into expressions and formula Rearrange simple formula	F-T1-U2 H-T1-U2	Expanding double brackets inc with co-efficients Factorising quadratic expressions using difference of 2 squares Rearrange formulae to change the subject Substitute negatives and fractions into formula and into kinematics formula	H-T1-U2
Graphs	Plot straight line graphs Plot and interpret real life graphs	X	Plot straight-line graphs Recognise special St-line grpahs Use y=mx+c to identify gradient and intercept Find equation of the line Recognise and sketch quadratic Plot and interpret graphs in a real context	H-T3-U6	Use y=mx+c to identify parallel and perpendicular lines Find equation of straight line from one point and gradient Understand relationship between gradients of para and perp Recognise and sketch quad/cubic/reciprocal etc Plot and interpret graphs (inc Exponential grphs) in a real context Recognise and use the equation of a circle (centre at origin)	H-T3-U6
Equations	Use function machines Solve simple equations Solve equations with unknown on both sides Relate skills to problems involving Perimeter and angles Understand basic inequalities	F-T3-U5	Solve equations using graphs Derive equations Solve linear inequalities and represent on number line	F-T3-U5	Solve equations with unknown on both sides, negatives and fractions Represent solutions using set notation and on a graph Solve equations using simple iteration methods Complete simple proof ('show that')	H-T1-U2
Sequences	Generate terms of a sequence from term-to-term or position-to-term rule Deduce expressions to calculate the nth term	F-T3-U5	Recognise and use Fibonacci type and quadratic sequences (substitute)	H-T1 –U2	Deduce expressions to calculate the nth term of quadratic sequence Recognise and use simple geometric progressions	H-T1 –U2
Communication	Understand and use the concepts and vocabulary Describe key features of real life graphs. Use the nth term to describe a sequence.		Argue mathematically to show algebraic expressions are equivalent Use algebra a to support and construct arguments (derive equations)		Begin to use proof algebraically to support and construct arguments	

Number	Working Towards	SOW	Meeting	SOW	Exceeding	SOW
Basic skills	Understand place value and decimals Round and estimate numbers to several sf or dp Recognise factors and multiples Calculate roots and squares	F-T1-U1	Estimate solutions Calculate HCF and LCM Use prime factor decomposition Solve problems using HCF/LCM/Primes	F-T1-U1 H-T1-U1	Apply and interpret limits of accuracy, including upper and lower bounds	
Calculations	Perform calculations with integers, fractions, decimals and mixed numbers with both positive and negative numbers Calculate exactly with fractions Use of a calculator accurately		Calculate with roots and integer indices Calculate exactly with multiples of π Calculate with standard form A x 10^n (where A is an integer between 1 and 10)	H-T1-U1	Estimate powers and roots of any given positive number Calculate with roots, and with fractional indices Calculate exactly with surds	H-T1-U1
Fraction/ decimal/%	Compare fractions/decimals/percentages Four operations of fractions Work interchangeably with terminating decimals Interpret fractions and percentages as operators	F-T2-U4	Complete real-life calculations Work interchangeably with terminating decimals in more complicated situations Interpret fractions , decimals and percentages as operators and use multipliers	F-T2-U4 H-T2 –U4	Change recurring decimals into their corresponding fractions and vice versa Understand and use multipliers to simplify the calculations	H-T2-U4
Ratio/ proportion	Use simple ratio to share amounts	H-T2-U4	Divide quantity by a ratio Describe ratio Cancel ratio	H-T2-U4	Convert ratio to 1:m or m:1 Divide quantity by a ratio (more than 2 parts) Use ratio to compare scale to real life Use ratio to convert between measures and currency Recognise direct proportion on a graph/table	H-T2-U4
Communication	Explain concisely the reasoning behind the concepts Apply ratio to real contexts		Solve problems involving direct and indirect proportion		Set up and solve equations and explain the process Develop Success Criteria	
Shape	**Working Towards**	**SOW**	**Meeting**	**SOW**	**Exceeding**	**SOW**
Properties of Shape	Identify 2-D and 3-D shapes Recognise parallel and perpendicular lines Know basic angle rules Recognise notation Understand regular and irregular	F-T3-U6	Describe and compare 2-D and 3-D shapes Describe parallel and perpendicular lines Apply basic angle rules Use rules involving special triangles Use the notation	F-T3-U6 H-T3-U5	Understand the properties of 2-D and 3-D shapes Use angle Facts in Proofs	H-T3-U5
Measurement and Calculations	Measure, estimate and draw angles Sketch and draw shapes Solve simple angle problems	F-T3-U6	Know and apply Pythagoras' Theorem Use angle rules to find missing angles Use rules of polygons to solve problems	F-T3-U6 H-T3-U5	Explain the rules / derive the formula Use the trigonometric ratios of SOHCAHTOA to find missing angles or sides Calculate using Pythagoras' Theorem in surd form Solve problems involving angles of elevation and depression Know the exact trig values (eg cos90=0)	H-T3-U5
Position and Direction	x		x	x	x	
Communication	Beginning to use specialise vocabulary to explain their decision making.		Use and apply geometric facts to derive rules and support arguments		Use knowledge the proof theorems Write mathematical arguments concisely using appropriate vocabulary.	