



NEWMARKET ACADEMY

At Newmarket Academy we follow the Mathematics Mastery Curriculum Plan from year 7 to year 11.

The curriculum is cumulative in nature and designed to ensure that students have a depth of understanding of the basic skills and prerequisites of topics due to be taught later in the course.

The belief that every child can succeed in mathematics, regardless of background and prior attainment, is fundamental to Mathematics Mastery.

Pupils who grasp concepts rapidly are challenged through being offered rich and sophisticated problems before any acceleration through new content in preparation for key stage 4. Those who are not sufficiently fluent consolidate their understanding through additional practice, before moving on.

The five year plan is outlined below:

Year 7

Autumn 1 Solve word problems (add and subtract)	Autumn 2 Explain and investigate (multiply and divide)	Spring 1 Geometry	Spring 2 Fractions	Summer 1 Applications of algebra	Summer 2 Percentages and statistics
All should be confident and competent in Key Stage 2 material. Review of these prerequisites may be useful for each unit:					
<ul style="list-style-type: none"> Number bonds Convert units Money +/– Measurement 	<ul style="list-style-type: none"> Mental strategies Multiplication facts Multiplication strategies Solve number problems 	<ul style="list-style-type: none"> Lengths and units Parallel and perpendicular Work with angles Division and the mean 	<ul style="list-style-type: none"> Equal parts Factors and multiples Tenths and hundredths Word problems Fractional areas 	<ul style="list-style-type: none"> Areas of rectangles and triangles Number patterns Algebraic notation Triangle and quadrilateral properties 	<ul style="list-style-type: none"> Decimals and problem solving Fractions of shapes Equivalence Order of operations
All will have access to this specific Key Stage 3 content:					
<ul style="list-style-type: none"> Place value (including decimals) Add and subtract (including decimals) Rounding Perimeter Mental strategies 	<ul style="list-style-type: none"> Factors and multiples Multiply and divide (including decimals) Area of rectangle, triangle and parallelogram Calculate the mean Further mental strategies 	<ul style="list-style-type: none"> Draw and measure angles Find unknown angles (straight lines, at a point, vertically opposite) Properties of triangles and quadrilaterals Unit conversions (linear) Symmetry and tessellation 	<ul style="list-style-type: none"> Equivalent fractions Compare and order fractions and decimals Change mixed numbers to improper fractions and vice versa Fraction of a quantity Multiply and divide fractions 	<ul style="list-style-type: none"> Order of operations Substitution Form and simplify algebraic expressions Expand over a single bracket, and factorise Sequences (term-to-term, not n^{th} term) 	<ul style="list-style-type: none"> Construct and interpret statistical diagrams including pie charts Convert between percentages, vulgar fractions and decimals Percentage of a quantity Find the whole, given the part and the percentage
As well as looking at the termly projects, highest attaining students may be stretched through depth by consideration of the following:					
<ul style="list-style-type: none"> Different counting systems or bases Generalisation Upper and lower bounds 	<ul style="list-style-type: none"> Shikaku puzzles Different counting systems or bases Alternative methods of multiplication Generalisation 	<ul style="list-style-type: none"> Tessellating triangles and quadrilaterals Tangram investigations Rigid shapes 	<ul style="list-style-type: none"> Terminating and recurring decimals Fractions of tangrams Shape block challenges 	<ul style="list-style-type: none"> Four fours Patterns and generalising Algebraic mean questions 	<ul style="list-style-type: none"> Comparing and converting between representations Applications of percentages

Year 8

Autumn 1 Number	Autumn 2 Algebraic expressions	Spring 1 2-D geometry	Spring 2 Proportional reasoning	Summer 1 3-D geometry	Summer 2 Statistics
All should be confident and competent with Year 7 material. Review of these prerequisites may be useful for each unit:					
<ul style="list-style-type: none"> Factors, multiples and primes Multiplication and division Fraction equivalence and calculations 	<ul style="list-style-type: none"> Problem solving with fractions Order of operations Form algebraic expressions Substitution 	<ul style="list-style-type: none"> Angle types Angle facts Rectangle and triangle areas \times/\div by powers of 10 Problem solving with negative numbers 	<ul style="list-style-type: none"> Rounding Bar modelling with fractions Fraction \times/\div Bar modelling with equations FDP equivalence 	<ul style="list-style-type: none"> Rectilinear areas Fraction $+/-$ Problem solving with fractions Percentage increase and decrease Substitution with negatives 	<ul style="list-style-type: none"> Statistical diagrams Ratio and rate The mean Calculator skills and rounding
All will have access to this specific Key Stage 3 content:					
<ul style="list-style-type: none"> Primes and indices Prime factorisation, squares and cubes Use of Venn diagrams to find LCM and HCF Add and subtract fractions 	<ul style="list-style-type: none"> Order and calculate with negative numbers Form and solve linear equations (unknowns on one side) Use more complex algebraic expressions Linear sequences: n^{th} term 	<ul style="list-style-type: none"> Construct triangles and quadrilaterals Calculate unknown angles (including parallel lines) Unit conversions (including area) Area of a trapezium Areas and perimeters of composite figures 	<ul style="list-style-type: none"> Percentage increase and decrease, including multipliers Reverse percentage problems Ratio (equivalent, of a quantity) and rate Scaling and multipliers Speed, distance, time 	<ul style="list-style-type: none"> Use of significant figures and estimation Circumference and area of a circle Visualise and identify 3-D shapes and their nets Volume of cuboid, prism, cylinder, composite solids Surface area 	<ul style="list-style-type: none"> Collect and organise data, including surveys Interpret and compare statistical representations Mean, median and mode averages The range and outliers
As well as looking at the termly projects, highest attaining students may be stretched through depth by consideration of the following:					
<ul style="list-style-type: none"> Egyptian fractions Continued fractions HCF and LCM generalisation 	<ul style="list-style-type: none"> Explore non-linear sequences T-totals 	<ul style="list-style-type: none"> Similarity and ratio Complex constructions Simple angle proofs 	<ul style="list-style-type: none"> Density Area scale factors Loan repayment 	<ul style="list-style-type: none"> Platonic solids Percentage errors Plans and elevations 	<ul style="list-style-type: none"> Misleading graphs Equal width histograms Sampling methods

This framework follows the content and assessment objectives set out by DfE and Ofqual and, hence, reflects the requirements of GCSE mathematics offered by AQA, Eduqas, OCR and Pearson.

Year 9

Autumn 1 Graphs and proportion	Autumn 2 Algebraic expressions	Spring 1 2-D geometry	Spring 2 Equations and inequalities	Summer 1 Geometry	Summer 2 Statistics
All should be confident and competent with Year 7 and 8 materials. Review of these prerequisites may be useful for each unit:					
<ul style="list-style-type: none"> Read scales Linear equations Proportion Percentage increase and decrease 	<ul style="list-style-type: none"> Make expressions Expressions and area Substitution Powers and roots Problem solving with a calculator 	<ul style="list-style-type: none"> Area and circumference Angles on lines and in triangles Angles in parallel lines Pie charts 	<ul style="list-style-type: none"> Linear graphs Sequences Manipulate formulae Problem solving with algebra 	<ul style="list-style-type: none"> Compound areas FDP conversion Averages and the range 	<ul style="list-style-type: none"> Venn diagrams and two-way tables Powers of 10 and standard form Number problems with fractions and decimals Problem solving with algebra
All will have access to this specific Key Stage 3 content:					
<ul style="list-style-type: none"> Cartesian coordinates including midpoint of a line segment Linear graphs Direct and inverse proportion Calculate with scales Standard form 	<ul style="list-style-type: none"> Sequences including arithmetic and geometric Expand binomials and factorise simple quadratics Change the subject of familiar formulae 	<ul style="list-style-type: none"> Construction and loci Congruence and similarity Angles in polygons Properties of shapes 	<ul style="list-style-type: none"> Construct and solve equations and inequalities (unknowns on both sides) Graphical solutions to simultaneous linear equations Quadratic and other graphs 	<ul style="list-style-type: none"> Pythagoras' theorem Transformations (translation, rotation, reflection) Use known angle and shape facts to obtain simple proofs Probability 	<ul style="list-style-type: none"> Mean of grouped data Compare two data sets Stem-and-leaf diagrams Scatter graphs Exploring trigonometry
As well as looking at the termly projects, highest attaining students may be stretched through depth by consideration of the following:					
<ul style="list-style-type: none"> 3-D coordinates Explore linear and non-linear graphs 	<ul style="list-style-type: none"> Algebraic proof 	<ul style="list-style-type: none"> Geometrical proof Euclidean geometry Complex constructions 	<ul style="list-style-type: none"> Regions on graphs Linear programming Modelling 	<ul style="list-style-type: none"> Multiple transformations 3-D Pythagoras Probability problems 	<ul style="list-style-type: none"> Equations of lines of best fit Further trigonometry
Throughout Year 9					
<ul style="list-style-type: none"> Approximation and significant figures Addition, subtraction, multiplication and division with whole numbers, fractions and decimals Percentage increase and decrease, finding the whole given the part and the percentage 					

Year 10

Autumn 1 Number	Autumn 2 Geometry	Spring 1 Reasoning	Spring 2 Geometry & number	Summer 1 Sampling & probability	Summer 2 Applications of algebra
All should be confident and competent in Key Stage 3 material. Review of these prerequisites may be useful for each unit:					
<ul style="list-style-type: none"> Calculate with fractions Convert and solve problems with fractions and percentages Review indices 	<ul style="list-style-type: none"> Ratio notation, links to vulgar fractions, decimals and percentages Reflection, rotation and translation Pythagoras' theorem 	<ul style="list-style-type: none"> Algebraic notation and substitution, including kinematics formulae Angles and shapes Straight-line graphs Equations and inequalities Rearranging formulae 	<ul style="list-style-type: none"> Decimal calculations and rounding Units Area and perimeter of plane shapes, including composite shapes Congruence 	<ul style="list-style-type: none"> Sample spaces The probability scale Vulgar fractions, decimals and percentages 	<ul style="list-style-type: none"> Real-life graphs Deriving and using expressions, formulae and equations
All will be assessed on this specific Key Stage 4 content					
<ul style="list-style-type: none"> Calculations with and rules of indices Calculations with standard form Geometric change including compound interest, growth and decay Standard non-linear sequences 	<ul style="list-style-type: none"> Enlargement Similar shapes Bearings Trigonometry in right angled triangles 	<ul style="list-style-type: none"> Algebraic arguments Geometric reasoning Equations of parallel lines Vectors 	<ul style="list-style-type: none"> Properties of 3-D shapes; their plans and elevations Surface area and volume of pyramids, cones and spheres (including exact answers) Estimation and limits of accuracy Loci Geometric proof 	<ul style="list-style-type: none"> Populations and samples Theoretical and experimental probability Probability of combined events, including tree diagrams and use of Venn diagrams Sample spaces and listing 	<ul style="list-style-type: none"> Expand and factorise binomials Quadratic equations Cubic and reciprocal graphs Linear simultaneous equations Graphical solutions of equations
Highest attaining students will also be assessed on the following material, which provides good preparation for Key Stage 5					
<ul style="list-style-type: none"> Recurrence relations Surds Recurring decimals Fractional indices Quadratic sequences 	<ul style="list-style-type: none"> Negative scale factors of enlargement Combine transformations 3-D trigonometry and Pythagoras' theorem 	<ul style="list-style-type: none"> Vector proofs Trigonometry graphs Equations of perpendicular lines Further inequalities 	<ul style="list-style-type: none"> Similar areas and volumes Upper and lower bounds Trigonometry in all triangles 	<ul style="list-style-type: none"> Conditional probability 	<ul style="list-style-type: none"> Complete the square, quadratic formula, quadratic inequalities Further simultaneous equations Algebraic fractions Exponential graphs
Throughout KS4: Students will need to keep working on key skills as they occur within other topics, as well as when the skills are being explicitly addressed. These include: Addition, subtraction, multiplication and division; order of operations; fractions, decimals and percentages; rounding and estimation; and algebraic notation.					

Year 11

Autumn 1 Algebra and geometry	Autumn 2 Number & statistics	Spring 1 Revision, extension 1	Spring 2 Revision, extension 2	Summer 1 Revision, extension 3	Summer 2 Examinations
<i>All should be confident and competent in Key Stage 3 material. Review of these prerequisites may be useful for each unit:</i>					
<ul style="list-style-type: none"> Ratio calculations Direct and inverse proportion Derive and use expressions, formulae and equations 	<ul style="list-style-type: none"> Simple statistical diagrams Averages and the range Solve number problems 	<ul style="list-style-type: none"> Review and revision 	<ul style="list-style-type: none"> Review and revision 	<ul style="list-style-type: none"> Review and revision 	<ul style="list-style-type: none"> Review and revision
<i>All will be assessed on this specific Key Stage 4 content</i>					
<ul style="list-style-type: none"> Arcs and sectors of circles Direct and inverse variation Proof in algebra and geometry 	<ul style="list-style-type: none"> Represent and describe distributions Identify misleading graphs Time series Correlation and lines of best fit Solve problems involving compound units 	<ul style="list-style-type: none"> Review and revision 	<ul style="list-style-type: none"> Review and revision 	<ul style="list-style-type: none"> Review and revision 	<ul style="list-style-type: none"> Review and revision
<i>Highest attaining students will also be assessed on the following material, which provides good preparation for Key Stage 5</i>					
<ul style="list-style-type: none"> Apply and prove circle theorems Equation of a circle and the tangent to a circle Variation with powers 	<ul style="list-style-type: none"> Histograms with equal and unequal class intervals Cumulative frequency graphs and box plots 	<ul style="list-style-type: none"> Functions and their inverses Composite functions Transformation of graphs 	<ul style="list-style-type: none"> Solve equations by Numerical methods Gradients of curves and areas under graphs 	<ul style="list-style-type: none"> Review and revision 	<ul style="list-style-type: none"> Review and revision
<i>Throughout KS4:</i> Students will need to keep working on key skills as they occur within other topics, as well as when the skills are being explicitly addressed. These include: Addition, subtraction, multiplication and division; order of operations; fractions, decimals and percentages; rounding and estimation; and algebraic notation.					

Staff:

Mrs G Guenigault (Head of Mathematics)

Mrs A Wreford (Second in Department)

Mr R Bolton (Lead Practitioner)

Mrs C Conway-Jarrett

Mrs C Luterbacher

Mr L Crick

Mr B Woodward

Mr C Simmons

SMSC Foci:

Art with constructions

Symmetry in Art.

Applying maths to real life situations

Career Pathways:

Accountancy, Maths Teacher, Engineer, Architect, Banking and Finance.

Most recent results: (2016/17)

GCSE Grades 9 – 4 62%