

Mathematics
Key Stage 3 Curriculum Map

Woolwich Polytechnic School for Boys

YEAR 9 CURRICULUM EXPECTATIONS

KEY KNOWLEDGE	KEY SKILLS
By the end of Year 9, pupils know: • Number and proportional structures involving fractions, decimals, percentages, percentage change, reverse percentages, simple interest, ratio and rates. • Number representation and accuracy involving standard form, positive and negative indices, rounding, truncation, error intervals and calculator notation. • Algebraic structure across formulae, inequalities, linear and quadratic expressions, factorisation, equations and their graphical representations. • Geometrical and measurement relationships involving Pythagoras, angles, bearings, circles, sectors, cylinders, transformations, similarity, congruence, vectors and constructions. • Statistical and probabilistic models involving expected frequency, tree diagrams, scatter graphs, grouped data, averages and frequency polygons. • The role of modelling, assumptions, units, exact and approximate values, bounds, proof and critical interpretation in validating mathematical results.	By the end of Year 9, pupils can: • Calculate fluently with percentages, standard form, indices, ratio and rates, selecting exact, approximate or calculator methods appropriately. • Form, rearrange, simplify, factorise and solve formulae, inequalities and linear or quadratic equations using accurate algebraic notation. • Plot and interpret linear, quadratic, distance-time and scatter graphs and connect their features to algebraic forms and real contexts. • Solve multi-step problems involving reverse percentages, direct and inverse proportion, speed, rates, currency, scale and similarity. • Apply geometrical facts and theorems to calculate measures and solve problems involving bearings, transformations, vectors and constructions. • Model and analyse probability and data, justify conclusions, test assumptions, check units and bounds, evaluate limitations and communicate reasoning precisely.

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	AUTUMN 1 Units 1 - 5	AUTUMN 2 Units 6 - 10	SPRING 1 Units 11 - 15	SPRING 2 Units 16 - 19	SUMMER 1 Units 20 - 24	SUMMER 2 EOY + Units 25 - 29
KNOWING WHAT	Fraction, decimal and percentage equivalence, ordering and amounts. Percentage change, reverse percentages and simple interest. Experimental probability, expected frequency, frequency trees and tree diagrams. Standard form calculations and calculator notation. The structure of formulae and changing the subject.	Single and double linear inequalities and their solution sets. Straight-line graphs in the forms y = mx + c and ax + by = c. Quadratic graphs, roots, intercepts and turning points. Quadratic factorisation, the difference of two squares and solutions. Index laws with positive and negative powers.	Truncation, rounding and error intervals. Plans and elevations as representations of three-dimensional objects. Pythagoras' theorem and the hypotenuse of a right-angled triangle. Ratio, sharing and multiplicative comparison. Direct and inverse proportion and currency conversion.	The relationships between speed, distance and time. Rates, unit rates, total cost and rates of pay. Distance-time graphs and the meaning of gradient in context. Arc length, sector area, and the surface area and volume of cylinders.	Angle relationships involving parallel lines, quadrilaterals and polygons. Three-figure bearings and geometrical conventions. Translations, reflections, rotations and positive enlargements. Similarity, scale factors and proportional sides. Congruence, triangle conditions and accurate construction.	Correlation, lines of best fit and the limitations of scatter graphs. Types of data, suitable representations, averages and population comparisons. Grouped frequency tables, estimated averages and frequency polygons. Column vectors, scalar multiplication and parallel vectors. Loci, perpendicular and angle bisectors, and standard constructions.
KNOWING HOW	Convert, order and calculate with fractions, decimals and percentages. Solve percentage-change and reverse-percentage problems and calculate simple interest. Calculate and interpret experimental probabilities and expected frequencies using trees. Calculate with standard form and use calculator displays correctly. Rearrange one-step and multi-step formulae.	Construct, solve and represent single and double inequalities. Plot and interpret straight-line graphs and determine their equations. Plot quadratic graphs and solve equations graphically. Factorise and solve quadratic equations algebraically. Apply index laws to simplify numerical and algebraic expressions.	Truncate values and determine appropriate error intervals. Draw and interpret plans, front elevations and side elevations. Use Pythagoras' theorem to calculate missing lengths in 2D contexts. Simplify ratios, share quantities and solve ratio problems. Solve direct and inverse proportion problems and convert currencies.	Calculate speed, distance and time in multi-step contexts. Calculate unit rates, costs, elapsed time and rates of pay. Plot and interpret distance-time graphs and calculate speed from gradient. Calculate arc lengths, sector areas, cylinder surface areas and volumes.	Combine angle facts and calculate angles in polygons and parallel-line diagrams. Measure, draw and calculate bearings in contextual problems. Perform and describe mixed transformations, including enlargements. Use similarity to determine unknown sides and solve scale problems. Identify congruent triangles and construct triangles accurately.	Retrieve and apply Year 9 knowledge in cumulative assessment and problem solving. Plot and interpret scatter graphs and use lines of best fit cautiously. Select, present and compare data and estimate averages from grouped data. Add, subtract and scale column vectors and identify parallel vectors. Carry out accurate constructions and solve construction problems.
PLANNED ASSESSMENT	Unit tests for Units 1-5, supported by ongoing formative assessment through retrieval, questioning, classwork and homework.	Unit tests for Units 6-10. Autumn assessment after Unit 8, followed by Units 9-10 and responsive consolidation.	Unit tests for Units 11-15, supported by ongoing formative assessment and targeted feedback.	Unit tests for Units 16-19. Spring assessment after Unit 18, followed by Unit 19 and responsive consolidation.	Unit tests for Units 20-24, supported by cumulative retrieval and preparation for the end-of-year assessment.	Revision and end-of-year assessment at the start of Summer 2, followed by unit tests for Units 25-29.

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