KS3 Curriculum – Maths

The Ramsey Academy

	Autumn Term														Spring Term												Summer Term													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Year 7	**Topic:** GM1; NP1; NP2; NP3; NP4														**Topic:** NP5; NP6; A1											**Topic:** NP7; NP8; NP8													
	Declarative Knowledge: GM1 Understand dimensions or objects in 0D /1D, including points, lines, rays and segments. Know labelling conventions for lines and angles. Use a ruler to measure lines, as well as estimating length. NP1 Understand that Place value determines the value of a digit within a number and can be used to represent, compare, order and round integers and decimals. NP2 Mental and written strategies for addition of positive integers and decimals, including application to (worded) problems, and for subtraction of integers and decimals. NP3 Fluent recall of the multiplication tables to 12x12. Mental and written strategies for multiplication of positive integers and decimals. Finding multiples and the lowest common multiple by systematic listing. NP4 Decimals can be compared and ordered, rounded or estimated. Place value determines a digit's value and decimals can represent parts of a whole														**Declarative Knowledge:** NP5 Understand order of operations Rules apply to integers and decimals. NP6 Understand negative numbers in various contexts, including temperature and finance, and on a number line (vertical and horizontal). Addition and subtraction with directed numbers. A1 Algebraic expressions contain variables and constants, and an associated notation. Like terms can be identified and combined. Understand difference between Expressions /equations.													**Declarative Knowledge:** NP7 Know that a fraction can represent a part of a whole, or a division of two integers. Understand visual and numerical representations of proper and improper fractions, and understand equivalent fractions NP8 Know that a percentage is a fraction with denominator 100.; Find equivalent fractions, decimals and percentages Order a mix of fractions, decimals and percentages.; NP9 Understand that Powers representing shorthand repeated multiplication Square and cube numbers have specific numerical and geometric meanings and are inverse operations to squaring and cubing. Numbers can be classified as square numbers, cube numbers and powers of ten.												
	Non-Declarative Knowledge: GM1 Students identify, draw, label and measure basic geometric objects using correct mathematical conventions. NP1 Students accurately apply mental and written methods for addition and subtraction to calculations and problems. NP3 Students use multiplication facts and methods fluently to calculate, generate multiples and solve problems. NP4 Students represent, compare, order, round and estimate decimals using place value understanding.														**Non-Declarative Knowledge:** NP5 Students apply the order of operations accurately when evaluating numerical expressions. NP6 Students represent and calculate with negative numbers in numerical and real-world contexts. A1 Students use algebraic notation correctly, simplify expressions and distinguish between expressions and equations.													**Non-Declarative Knowledge:** NP7 Students represent, compare and manipulate fractions, including generating equivalent fractions. NP8 Students convert, compare and order fractions, decimals and percentages to solve problems. NP9 Students use powers and roots, classify numbers by their properties and apply index notation in calculations.												
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	Curriculum Connection: Content can be tested in any of Mathematics Paper 1, 2 and 3														**Curriculum Connection:** Content can be tested in any of Mathematics Paper 1, 2 and 3											**Curriculum Connection:** Content can be tested in any of Mathematics Paper 1, 2 and 3												

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Year 8	**Topic:** Numeracy; NP9; A2; A3; A4; NP10														**Topic:** NP10; GM2; SP1												**Topic:** P11; A5; SP2; A6													
	Declarative Knowledge: Numeracy General revision on topics covered in Y7 NP9 Calculator methods, estimation, truncation and error intervals. Time calculations and unit conversions. A2 Algebraic notation, coefficients, powers and index laws. Algebraic expressions represent mathematical relationships. A3 Distributive law and factorisation. Methods for expanding brackets and multiplying binomials. A4 Equality and solving equations and Equations as mathematical models														**Declarative Knowledge:** NP10 Direct and inverse proportion and percentage multipliers. GM2 Angle facts for lines, triangles, quadrilaterals and polygons. Corresponding, alternate and vertically opposite angles. Bearings and polygon angle relationships. SP1 Data handling cycle. Measures of central tendency and spread.													**Declarative Knowledge:** NP11 Ratio notation, equivalent ratios, unit ratios and proportional relationships. A5 Substitution and formulae. Rearranging linear and non-linear formulae. SP2 Correlation, lines of best fit and time series data. A6 Coordinates, gradients, intercepts and graph forms. Relationships between equations and graphs.													
	Non-Declarative Knowledge: Numeracy Application of knowledge gained in Y7 NP9 Students can use calculators efficiently and estimate answers. Students can convert units of time and interpret timetables. A2 Students can construct and simplify algebraic expressions. Students can apply index laws and collect like terms. A3 Students can expand and factorise expressions. Students can multiply simple binomials. A4 Students can solve linear equations, including brackets and fractions. Students can form equations from contextual problems and can rearrange formulae and interpret solutions.														**Non-Declarative Knowledge:** NP10 Students can solve direct and inverse proportion problems. Students can calculate percentage increase and decrease. GM2 Students can solve angle and bearing problems. Students can calculate polygon angle sums. SP1 Students can represent and analyse statistical data. Students can calculate averages and range.													**Non-Declarative Knowledge:** NP11 Students can simplify and solve ratio problems. A5 Students can substitute into expressions and formulae. SP2 Students can draw and interpret scatter graphs. Students can use lines of best fit and analyse time series graphs. A6 Students can plot and interpret coordinates and graphs. Students can determine gradients and equations of lines.													
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Year 9	**Topic:** GM3; A1-6 (recap); A7; A8 (essentials); NP11														**Topic:** 012; A9; SP2; SP3;											**Topic:** M4; GM5; GM6; NP13												
	Declarative Knowledge: GM3 Area measures two-dimensional space and is measured in square units. Formulae for the area of triangles, quadrilaterals and circles. A1-6 recap Algebraic notation; properties of expressions, equations and coordinates Mathematical relationships using variables, equations and graphs. A7 Types of linear and non-linear sequences (square, triangular, cube, Fibonacci). Rules connecting term position and sequence values. A8 Inequality symbols and notation; represent inequalities on number lines and graphs. Solutions can be single, double or combined inequalities. NP11 Ratio notation and proportional relationships. Equivalent and unit ratios and links between ratios and fractions.														**Declarative Knowledge:** NP12 Standard form notation for large and small numbers. Laws of indices used in standard form calculations. SI prefixes and engineering form. A9 Gradient represents rate of change. Intercepts have contextual meaning. Relationship between speed/distance/time/acceleration SP2 Correlation relationships between variables/ causation. Time series data shows change over time SP3 Probability is measured on a scale from 0 to 1. Mutually exclusive probabilities sum to 1. Sample spaces and diagrams can represent outcomes.														**Declarative Knowledge:** GM4 Definitions and properties of congruence and similarity. Properties of vectors and geometric transformations. Congruence conditions: SSS, SAS, ASA and RHS GM5 Pythagoras' Theorem and its converse. Definitions of sine, cosine and tangent. Exact trigonometric values for 0°, 30°, 45°, 60° and 90°. GM6 Parts and properties of a circle. Formulae for circumference, area, arc length and sector area. Circle theorem facts and relationships. NP13 Ratio and rate relationships; direct and inverse proportion. Reverse percentages and simple interest. Compound units: speed, density and pressure.													
	Non-Declarative Knowledge: GM3 Calculate areas, including compound shapes, using appropriate formulae. Solve problems involving area, including rounding where appropriate. A1-6 Recap Manipulate algebraic expressions, solve equations, rearrange formulae. Also substitute values, plot and interpret graphs, analysing coordinate relationships. A7 Identify, analyse, continue and generate sequences, and find and use nth-term rules. A8 Solve linear inequalities, representing solutions algebraically and graphically, and form and solve inequalities from contexts. NP11 Simplify and find equivalent ratios, plus use unit ratios in scales and maps. Calculate missing values in ratio problems.														**Non-Declarative Knowledge:** A9 Interpret and construct contextual graphs plus calculate speed, distance, time, acceleration and displacement NP12 Convert to and from standard form and apply standard form in contextual problems. SP2 Draw and interpret scatter graphs, using lines of best fit. Interpolate and extrapolate from data and construct and interpret time series graphs. SP3 List outcomes systematically, apply counting principles, Calculate theoretical probabilities; use frequency trees, two-way tables and Venn diagrams.														**Non-Declarative Knowledge:** GM4 Read, write and use vectors. Perform and identify transformations and enlargements. Find missing lengths and justify congruence and similarity. GM5 Use Pythagoras' Theorem to find lengths and distances. Apply trigonometry to find missing sides and angles. Solve multi-step problems involving right-angled triangles. GM6 Calculate circumference, area, arc lengths, sector areas (exact form) Apply circle theorems to solve geometrical problems. NP13 Calculate reverse percentages and solve proportion problems. Use compound measures formulae; combine ratios and rates in context													
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