

## Rivers Academy Age Related Expectations - Mathematics

	End of KS2	Year 7	Year 8	Year 9	Year 10	Year 11
Number – number and place value  Number – addition, subtraction, multiplication and division  Number – fractions (including decimals and percentages)  Ratio and proportion  Algebra  Geometry – properties of shapes  Geometry - Measurement  Statistics	Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit. Round any whole number to a required degree of accuracy, use negative numbers in context, and calculate intervals across zero to solve numbers and practical problems that involve all of the above.  Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication  Perform mental calculations, including with mixed operations and large numbers. Identify common factors, common multiples and prime number	I can describe and continue sequences in diagram and number forms, both linear and nonlinear.  I can understand and use inverse operations.  I can understand the equivalence of algebraic expressions.  I can round numbers to the positive powers of ten.  I can represent tenths and hundredths on diagrams and number lines.  I can solve problems in the context of perimeter, money and frequency trees and tables.  I can find HCF and LCM of two and three digit numbers.	I can understand ratio and its link to multiplication and use ratio notation and can apply reduce ratios to simplest form and can calculate the circumference of a circle.  I can apply my knowledge of multiplying and dividing a fraction by an integer and a fraction.  I can understand Multiplying and dividing mixed numbers. I can apply my knowledge of expressing any ratio in the form 1:n.  I can understand and use the equations of straight lines of the form $y=kx$ and model situations by translating them into expression, formulae and graphs.	I can Interpret straight line graphs and find the equation of a straight line.  I can compare to linear sequence and find the rule for the nth term and can reduce equations to the form $y=mx+c$ .  I can understand and explore the gradients of perpendicular lines and can solve a pair of simultaneous equations using graphical methods.  I can understand the languages of faces, edges and vertices and know the names of common prisms and non-prisms.  I can apply FDP equivalence and ratio.  I can Add and subtract fractions(lowest common denominator)	I can enlarge shapes with a fractional and negative scale factor and can apply similarity to the lengths, area and volumes of shapes.  I can apply Pythagoras' Theorem, trigonometry, sine rule and cosine rule to confidently calculate the area, sides and angles of any triangle, including in 3D contexts.  I can apply my knowledge of algebra to solve equations and inequalities, to expand, factorise and solve quadratics and use graphical methods to solve algebra problems and represent inequalities.  I can form and solve linear and non-linear simultaneous equations both graphically and	I can use algebra to support and construct proofs and translate simple situations or procedures into algebraic expressions.  I can solve quadratic equations algebraically by factorising, by completing the square and by using the quadratic formula and interpret solutions to equations numerically using iteration.  I can interpret simple expressions as functions, use graphs of quadratic functions and solve problems with composite and inverse functions.  I can deduce turning points by completing the square, apply and prove the standard circle theorems and use vectors to construct geometric arguments and proofs.

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	<p>Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.</p> <p>Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.</p> <p>Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.</p> <p>Use simple formulae.</p> <p>Generate and describe linear number sequences.</p> <p>Express missing number problems algebraically.</p> <p>Find pairs of numbers that satisfy an equation with two unknowns.</p> <p>Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.</p>	<p>I can evaluate areas of triangles, rectangles and parallelograms.</p> <p>I can calculate the missing angles in a triangle and quadrilateral.</p> <p>I can add and subtract fractions and decimals.</p> <p>I can work out simple fractions and percentages of amounts, with and without a calculator.</p> <p>I can construct triangles given SSS, SAS and ASA</p> <p>I can calculate and use angles at a point, angles on a straight line and vertically opposite angles.</p> <p>I can use mental arithmetic strategies.</p> <p>I can draw and interpret Venn diagrams.</p> <p>I can calculate the probability of a single event.</p>	<p>I can draw and interpret scatter graphs and understand correlation.</p> <p>I can understand grouped and ungrouped data and can design one and two-way tables.</p> <p>I can List outcomes using sample space and diagrams for one and two events.</p> <p>I can find probabilities using tables and venn diagrams.</p> <p>I can Plot and interpret straight line graphs and make links between direct proportion and straight line, including lines parallel to the axes.</p> <p>I can find the midpoint of a line segment and can explore gradients. (H)</p> <p>I can expand, and factorise into, single</p>	<p>I can construct 3-D shapes from nets, and construct the net of a given 3-D shape. And Understand congruence.</p> <p>I can determine whether a triangle is right-angled and can calculate missing sides in right angled triangles.</p> <p>I can develop more complex geometrical proof and can find the result of a series of transformations. (H)</p> <p>I can understand relative frequency, independent events and expected numbers of outcome.</p> <p>I can apply my knowledge of interpreting other graphs and can represent inequalities.</p> <p>I can enlarge shapes by a negative scale factor and can use my knowledge of inverse proportion graphs.</p>	<p>algebraically.</p> <p>I can interpret and use bearings, perform operations using vectors and use vectors to construct proofs.</p> <p>I can calculate arc length and sector area and can apply and prove the standard circle theorems.</p> <p>I can apply my knowledge of ratio and fractions across mathematics skills and can calculate with dependent and conditional probability.</p> <p>I can use percentages to solve growth and decay problems and work with the general iterative process.</p> <p>I can construct and interpret histograms, cumulative frequency graphs and box plots and calculate the inter quartile range.</p>	<p>I can construct and use equations that describe direct and inverse proportion.</p> <p>I can use positive, fractional and negative scale factors for enlargement, describe and perform multi-step transformations.</p> <p>I can recognise graphs of trigonometric functions and sketch translations of the graph of functions.</p> <p>I can use the product rule for counting and interpret conditional probabilities through representations, work with recurring decimals and their corresponding fractions and use proofs with shape, vectors and data.</p> <p>I can identify the areas in which I need to revise and solve problems which cover multiple aspects of the curriculum.</p>
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	<p>Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places.</p> <p>Draw 2-D shapes using given dimensions and angles. Recognise, describe and build simple 3-D shapes, including making nets.</p> <p>Interpret and construct pie charts and line graphs and use these to solve problems. Calculate and interpret the mean as an average.</p>	<p>I can recognise prime, square and triangle numbers.</p> <p>I can express a number as a product of prime factors.</p>	<p>brackets and understand how to distinguish between equation, expressions, formulae and identities.</p> <p>I can describe, interpret and compare observed distributions and construct appropriate tables, charts and diagrams including frequency table, bar charts, pie charts and pictograms.</p>	<p>I can understand similar triangles- exploring ratios in right angled triangles.</p> <p>I can apply my knowledge of drawing and reading from quadratics and can interpret other graphs (e.g. reciprocal, piece-wise )</p>	<p>I can simplify expressions involving squares and surds, change recurring decimals into fractions and interpret limits of accuracy, including upper and lower bounds.</p> <p>I can calculate the nth term of a linear and quadratic sequence and interpret sequences with surds.</p> <p>I can estimate the roots and powers of any positive numbers and calculate with fractional indices .</p> <p>I can simplify and manipulate algebraic expressions and fractions and use algebraic expressions to construct proofs</p>	
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