



Mathematics	Working towards expected outcomes	Working at expected outcomes	Working beyond expected outcomes
Autumn Term	<p>Your child is not yet making the expected progress within this course.</p> <p>Students working towards expected outcomes in Y7 can:</p> <ul style="list-style-type: none"> Recall the Rules of Algebra (but not always remember to use the rules in all settings) and evaluate basic expressions with positive values of the variable. Solve basic one-sided equations but lack a fluency in efficient mathematical layout or when working with negatives and/or fractions; apply this skill with given basic formulae Show some fluency in written calculation but may work with error and not always appreciate the reasonableness of the answer Work with one stage calculations with negatives and beginning to work with squaring and cubing Recall many terms to describe shapes and begin to recall the properties of key shapes and solids; measuring and constructing most 	<p>Your child is achieving the expected progress for this point within the course.</p> <p>Students working at expected in Y7 can:</p> <ul style="list-style-type: none"> Use the Rules of Algebra consistently to write expressions and evaluate expressions when the variable is known in value, adhering to the rules of BIDMAS. Solve a range of one-sided equations, working with a strong mathematical technique and having success with negatives and fractions; apply this skill with a range of formulae. Show fluency and accuracy in all written calculations with any operation, including use of basic powers and roots and in real life Work accurately with all operations with negative numbers and successfully substitute negatives into expressions and formulae Describe shape properties and characteristics with a range of key vocabulary; use angle notation and construct and measure angles 	<p>Your child is working beyond the expected progress for this point within the course.</p> <p>Students working beyond expected in Y7 can: In addition to the skills listed under Working At for this topic, students working beyond expected outcomes can:</p> <ul style="list-style-type: none"> Use the Rules of Algebra to write expressions in range of real-life settings and evaluate complex expressions when the variable is known in value, including powers, roots and negative terms. Solve one-sided equations with fractional coefficients and those of their own derivation; work with a range of formulae, including ones they have written Show fluency and accuracy in all written calculations and work in a range of real-life settings, always checking that solutions are reasonable Evaluate all expressions with negatives, including more complex algebraic expressions; appreciating when powers of negatives are positive or negative and when roots exist Eloquently use all shape terminology and properties and apply these facts, such as looking at why regular hexagons tessellate. Accurately construct and



	<p>angles accurately and beginning to apply this skill with triangle construction; beginning to spot nets of solids and construct their own</p> <ul style="list-style-type: none">• Simplify basic algebraic expressions but may make error with negative terms or spotting/maintaining like terms; expand single brackets and factorise basic expressions, although not always fully• Add and subtract decimal values and to round to decimal places; beginning to work with significant figures• Evaluates basic estimation calculations but not always rounding all values to the one significant figure• Finds basic perimeter and areas, not always recalling the correct formula for key shapes; finding basic surface areas and volumes, such as cuboids	<p>accurately; construct a range of triangles using protractor and compass; identify nets of solids and construct for cuboids and prisms</p> <ul style="list-style-type: none">• Simplify most expressions in algebra involving any of the four operations; expand and factorise a variety of expressions, including those involving coefficients and basic powers; begin some basic reasoning with algebra• Works accurately with decimals and the four rules; being able to round numbers to a specified degree of accuracy, including with decimal places and significant figures• Estimates answers to calculations by rounding values to one significant figure and working with estimating powers and roots by recalling known square and cube numbers• Finds the perimeter and area of a range of shapes, including composite shapes; recall formulae for area of rectangles, triangles, parallelogram & trapezia; evaluate the surface area and volume of a range of solids, including prisms	<p>measure with angles, triangles and further shapes, such as parallelograms. Identify and sketch all nets, such as cylinders</p> <ul style="list-style-type: none">• Work accurately with all simplification, including complex terms and both fractions and powers; expand/factorise a full range of expressions involving brackets, including those with negatives and attention to BIDMAS. Successfully undertake “Show that” and mathematical argument in algebra• Undertake all decimal calculations proficiently (four operations) and to appreciate the reasonableness of solutions obtained; being able to round all numbers, whether large or small, to any degree of accuracy• Work with applied estimation questions, including those involving powers and roots• Evaluates perimeter, area, surface area and volume for a range of solids; to successfully apply this knowledge in a variety of problems; to fully understand area and volume units and to convert between these.
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Spring Term

Students working **towards** expected outcomes in Y7 can:

- Recalls the equation form of horizontal and vertical lines and plots simple diagonals on given axes
- Recall the divisibility tests for 2,5 and 10 and begin to work with and understand those for 3, 4, 6, 8 and 9; can successfully find highest common factors and lowest common multiples of values (less than 100) and splits most numbers into its prime factors, not always accurate with larger numbers
- Find the probability of basic events; works with simple lists and can complete a given sample space diagram

Students working **at** expected in Y7 can:

- Recall the shapes of horizontal, vertical and diagonal line graphs from their equations, committing both $y = x$ and $y = -x$ to memory; plotting a variety of line graphs for explicit graph equations, including construction of their own axes; find the missing vertex of a shape drawn on coordinate axes
- Recall and work with divisibility tests for 2, 3, 4, 5, 6, 8, 9 and 10; carry out a full test to search for prime numbers; use the language of factors, multiples and primes accurately; expresses any value as a product of its prime factors and uses such form to find larger common factors and multiples
- Work with the probability scale to determine the numerical probability of an event; can list outcomes and state how many outcomes are possible (using the product rule); works with sample space diagrams to find the chance of outcomes

Students working **beyond** expected in Y7 can:

In addition to the skills listed under Working At for this topic, students working beyond expected outcomes can:

- Identify or plot a range of horizontal, vertical and diagonal lines (including use of both implicit and explicit form) and to reason about points on/above or below these lines; accurately works with geometrical shapes on coordinate grids, identifying all cases of missing vertices
- Can recall and apply all divisibility tests, generating their own tests for larger values beyond 10; accurately finds highest common factors and lowest common multiples using prime factor decomposition and can use the latter to speculate if a number is square, for instance, finding its square root
- Works with more complex probability settings and can decide a correct tool to support their calculations, including lists, sample space diagrams and the product rule



- Solves double sided-equations with positive algebraic terms and integer solutions, including those involving brackets
- Begins to recall the known fraction family conversions and begins to convert between fractions, decimals and percentages with a suitable method
- Knows the four rules of fractions but many not efficiently employ these rules or do so accurately or with an appreciation of the solution's size
- Finds simple mental percentages

- Solves double-sided equations accurately, including those with negative algebraic terms on one or both sides and/or those with brackets; solves problems by establishing and solving their own equation in basic cases
- Recalls all fraction family conversions, such as $\frac{1}{8}$; employs a suitable method to convert between most fraction, decimal and percentages
- Successfully uses the four rules of fractions, including in simple context
- Finds mental percentages and the results of successive percentage change; works in real life settings such as finding interest on savings

- Solves a wide range of double-sided equations, including those with negative terms and fractional coefficients or those requiring prior simplification; construct and solve their own equations, even in complex problems, and interpret the solution
- Fluently recalls and converts between all instances of fraction, decimal and percentage form
- Works with all fraction calculations accurately, determining if solutions are reasonable; efficiently cancels common factors prior to multiplication and works with powers and roots of fractions
- Accurately works with all mental percentage calculations and a range of real life settings





Summer Term	<p>Students working towards expected outcomes in Y7 can:</p> <ul style="list-style-type: none">• Simplify basic ratios; works with ratio on basic settings and can share small quantities in a given ratio• Can work with direct proportion in simple numerical settings• Uses the basic rules of angles in simple settings, often employing a numerical layout and not necessarily communicating their choice of angle or rule with correct notation or wording• Continues a range of basic sequences and uses written term-to-term rules• Can find the nth term of an increasing arithmetic sequence	<p>Students working at expected in Y7 can:</p> <ul style="list-style-type: none">• Understand ratio notation for two or more quantities, simplifying such ratios; uses ratio to find unknown quantities in a range of problems including linking ratio to fractions and sharing in given ratio; combines to ratios• Understand the difference between direct and indirect proportion and find quantities in simple proportion problems using a numerical technique• Recalls all rules of angles and can use them in simple settings, including the rules of angles with parallel lines• Begin to construct a formal argument with three letter angle notation and angle reasons• Continues a range of sequences by pattern spotting or using either the written term-to-term rule or algebraic position-to-term rule• Can identify prime, square, cube, triangular, Fibonacci and powers of 2	<p>Students working beyond expected in Y7 can: In addition to the skills listed under Working At for this topic, students working beyond expected outcomes can:</p> <ul style="list-style-type: none">• Works with ratio in a variety of settings and contexts, including those that require fraction and percentage skills• Understands proportion and can apply their knowledge to complex numerical proportional challenges including those in which three variables are changing• Work with a range of problems that require all cases of the rules of angles and adopt a fluent layout to their communication, including the quoting of rules of angles employed• Finds the nth term formula for a range of arithmetic sequences and understands why this formula is linear in form• Describe WHY a sequence formula works with reference to the structure of a problem
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	<ul style="list-style-type: none">• Uses the key basic conventions of a scientific calculator, may not always appreciate the need for brackets• Understands that data is collected when information is required and can use tally chart collection; represents in basic bar graphs and can construct pie charts when the total frequency is a factor or multiple of to 360°• Finds averages and range from a list of numbers• Can make basic comparisons between two averages	<p>sequences and understand the definition of an arithmetic sequence</p> <ul style="list-style-type: none">• Find the Nth term formula for an increasing or decreasing arithmetic sequence• Can use a scientific calculator in a range of settings, including the use of powers, roots, fractions and negatives; understands the concept of BIDMAS• Distinguish between discrete/continuous data and between qualitative/quantitative data; collects data/statistics and represents this data in correct form graphically (bar, pie, vertical line)• Can find mean/median/mode and range from a list or a frequency table• Compares and contrasts two data sets with simple statements regarding the average and spread of such data, understanding how the spread is different to an average	<ul style="list-style-type: none">• Efficiently uses a scientific calculator, making use of calculator memory to replicate previous values; works efficiently in real life problems• Fully understands data types and always ascertains the best type of graph for different data types; can explain why the angles in a pie chart may not always sum exactly to 360°• Finds averages and range in a variety of setting, selecting the best average measure to use depending on the context given; understands the reasonableness of solutions and the affect of extreme data values
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