

Mathematics – KS3 Curriculum Highlighted points denote essential learning

Year 7	Topic/Unit (8 weeks) Algebraic Thinking	Topic/Unit (7 weeks) Place Value and Proportion	Topic/Unit (7 weeks) Applications of Number	Topic/Unit (6 weeks) Directed Number/Fractional Thinking	Topic/Unit (4 weeks) Lines and Angles	Topic/Unit (7 weeks) Reasoning with Number
Subject Content	<p style="text-align: center;"><u>Sequences</u></p> <ul style="list-style-type: none"> Sequences of diagrams Continue number sequences Term-to-term rules Generate a sequence Linear and non-linear sequences <p style="text-align: center;"><u>Understand and use algebraic notation</u></p> <ul style="list-style-type: none"> One-step function machines (number) One-step function machines (algebra) Substitution (one step) Find a function (one step) Two-step function machines (number) Two-step function machines (algebra) Substitution (two step) <p style="text-align: center;"><u>Equality and Equivalence</u></p> <ul style="list-style-type: none"> Like and unlike terms Collect like terms Solve 1-step linear equations (+/-) Solve 1-step linear equations (x/÷) Solve any 1-step linear equation 	<p style="text-align: center;"><u>Place value and ordering integers and decimals</u></p> <ul style="list-style-type: none"> Read and write numbers up to 10000 Understand the place value of a digit in integers up to 10000 Use < and > to compare two numbers Order a list of integers Work out intervals on a number line Position integers on a number line Round numbers to the nearest 10 Round numbers to the nearest 100 Round numbers to the nearest 10, 100 and 1000 Read and write numbers up to 1000000 Understand the place value of a digit in integers up to 1000000 Understand the place value of a digit in integers up to 1 000 000 <p style="text-align: center;"><u>Fraction, decimal and percentage equivalence</u></p> <ul style="list-style-type: none"> Explore equal parts Fractions on number lines Understand the meaning of percentage Explore tenths Explore hundredths Explore a half Explore quarters Explore fifths Explore equivalence 	<p style="text-align: center;"><u>Solving problems with addition and subtraction</u></p> <ul style="list-style-type: none"> Use number bonds Add integers Subtract integers Solve problems with addition and subtraction Financial maths Frequency trees <p style="text-align: center;"><u>Solving problems with multiplication and division</u></p> <ul style="list-style-type: none"> Double and halve Multiply integers and decimals by 10 Multiply integers and decimals by 10, 100 and 1000 Divide integers and decimals by 10 Divide integers and decimals by 10, 100 and 1000 Multiply up to a 4-digit number by a 1-digit number Understand sharing and grouping Short division Order of operations Solve multi-step problems <p style="text-align: center;"><u>Fractions and percentages of amounts</u></p> <ul style="list-style-type: none"> Find a unit fraction of an amount Find 10%, 25% and 50% of an amount Use any unit fraction to find the whole 	<p style="text-align: center;"><u>Operations and equations with directed number</u></p> <ul style="list-style-type: none"> Negative numbers and number lines Order directed numbers Perform calculations that cross zero Negative numbers and zero pairs Add directed numbers Subtract directed numbers Add and subtract directed numbers Multiply directed numbers Divide directed numbers Use the four operations with directed numbers <p style="text-align: center;"><u>Addition and subtraction of fractions</u></p> <ul style="list-style-type: none"> Add and subtract fractions with the same denominator Make a whole Subtract fractions from a whole Add and subtract fractions crossing Convert improper fractions to mixed numbers Convert mixed numbers to improper fractions Understand and use equivalent fractions Simplify a fraction Add and subtract fractions within 1 using equivalence Add and subtract fractions beyond 1 using equivalence 	<p style="text-align: center;"><u>Constructing, measuring and using geometric notation</u></p> <ul style="list-style-type: none"> Draw and measure line segments Estimate distances in centimetres and metres Convert between millimetres, centimetres and metres Classify angles (turns) Estimate the size of a turn in degrees Measure angles using a protractor Draw angles Recognise types of triangles Recognise types of quadrilaterals Identify polygons up to an octagon <p style="text-align: center;"><u>Geometric Reasoning</u></p> <ul style="list-style-type: none"> Angles in a full turn Angles in a quadrilateral Angles in a half turn Angles in a triangle Angles in special triangles Solve angle problems Perimeter on a grid Measure perimeter Calculate perimeter Use perimeter to work out side lengths Work out unknown sides and angles 	<p style="text-align: center;"><u>Developing Number Sense</u></p> <ul style="list-style-type: none"> Area on a grid Find the area of a rectangle Find the area of a parallelogram Find the area of a triangle Solve area problems <p style="text-align: center;"><u>Sets and Probability</u></p> <ul style="list-style-type: none"> The probability scale (words) The probability scale (0 to 1) List outcomes Equally likely events Experiments with probability <p style="text-align: center;"><u>Prime Numbers and Proof</u></p> <ul style="list-style-type: none"> Identify factors Identify prime numbers Identify multiples Identify square numbers Identify triangular numbers Identify cube numbers Understand and use counter-examples

	Topic/Unit (Autumn 1)	Topic/Unit (Autumn 2)	Topic/Unit (Spring 1)	Topic/Unit (Spring 2)	Topic/Unit (Summer 1)	Topic/Unit (Summer 2)
Year 8	Proportional Reasoning	Representations	Algebraic techniques	Developing Number	Developing Geometry	Reasoning with Data
Subject Content	<p>Ratio and Scale</p> <ul style="list-style-type: none"> - Understand ratio - Link ratios and fractions - Simplify ratios - Divide in a given ratio - Use a part to find other amount <p>Multiplicative change</p> <ul style="list-style-type: none"> - The unitary method - Use multipliers - Use recipes - Convert currency - Use conversion graphs - Scale diagrams <p>Multiply and divide</p> <ul style="list-style-type: none"> - Representations of fractions - Convert improper fractions to mixed numbers - Convert mixed numbers to improper fractions - Simplify fractions - Multiply a fraction by an integer - Multiply a fraction by a fraction 	<p>Working in the Cartesian plane</p> <ul style="list-style-type: none"> - Work with coordinates in the 1st quadrant - Work with coordinates in all four quadrants - Understand coordinates in all four quadrants - Lines parallel to the axes - Tables of values - Plot graphs of the form $y = mx$ - Plot graphs of the form $y = x + c$ - Plot graphs of the form $y = mx + c$ <p>Representing Data</p> <ul style="list-style-type: none"> - Read and interpret tables and scatter graphs - Plot scatter graphs - Understand linear correlation - Draw and use a line of best fit <p>Tables & Probability</p> <ul style="list-style-type: none"> - Two-way tables - Probability review - Sample space diagrams 	<p>Brackets, equations and inequalities</p> <ul style="list-style-type: none"> - Add and subtract with directed numbers - Collect like terms - Multiply and divide with directed numbers - Expand a single bracket - Factorise into a single brackets - Use bar models - Solve 1-step equations - Solve 2-step equations Small steps - Solve equations with brackets - Solve equations with fractions - Solve equations in context <p>Sequences</p> <ul style="list-style-type: none"> - Sequences - Generate a sequence given a rule in words - Generate a sequence given a simple algebraic rule <p>Indices</p> <ul style="list-style-type: none"> - Understand index notation - Simplify expressions - Collect like terms - Evaluate expressions 	<p>Fractions and percentages</p> <ul style="list-style-type: none"> - Convert fractions and decimals (using equivalence) - Convert fractions and decimals (using a calculator) - Fraction of an amount - Increase or decrease an amount by a fraction - Understand percentages (equivalence) - Find a percentage of an amount with a calculator - Find a percentage of an amount without a calculator - Increase or decrease an amount by a percentage. <p>Standard form index</p> <ul style="list-style-type: none"> - Positive powers of 10 - Multiply by powers of 10 - Convert large numbers to standard form <p>Number sense</p> <ul style="list-style-type: none"> - Add decimals - Subtract decimals - Solve addition and subtraction problems with decimals - Multiply decimals - Divide decimals - Round with decimals 	<p>Angles in parallel lines and polygons</p> <ul style="list-style-type: none"> - Measure and draw angles - Angles on a straight line - Vertically opposite angles - Angles around a point - Angles in a triangle - Angles in a quadrilateral - Alternate angles - Corresponding angles <p>Area of trapezia and circles</p> <ul style="list-style-type: none"> - Find the area of squares, rectangles and parallelograms - Find unknown lengths in rectilinear shapes - Find the area of a rectilinear shape - Find the area of a triangle - Find the area of a compound shape - Find the area of a trapezium 	<p>Line symmetry and reflection</p> <ul style="list-style-type: none"> - Recognise line symmetry - Step 2 Reflect a shape in a horizontal or vertical line (touching the shape) - Reflect a shape in a horizontal or vertical line (not touching the shape) - Reflect a shape in a diagonal line (touching the shape) - Reflect a shape in a diagonal line (not touching the shape) <p>Measures of location</p> <ul style="list-style-type: none"> - Range - Mode - Median - Mean - Use averages and range - Mean from an ungrouped frequency table <p>The data handling cycle</p> <ul style="list-style-type: none"> - Data collection - Ungrouped frequency tables - Grouped frequency tables - Represent data in pictograms - Interpret pictograms - Represent data in bar charts - Interpret bar charts - Represent data in pie charts (1) - Angles in sectors of pie charts - Represent data in pie charts (2) - Interpret pie charts <p>N.B – Measures of location and data handling may be taught together cross curricular.</p>

	Topic/Unit (Autumn 1)	Topic/Unit (Autumn 2)	Topic/Unit (Spring 1)	Topic/Unit (Spring 2)	Topic/Unit (Summer 1)	Topic/Unit (Summer 2)
Year 9	Reasoning with Algebra	Constructing in 2 and 3 Dimensions	Reasoning with Number	Reasoning with Geometry	Reasoning with Proportion	Representations and Revision
Subject Content	<u>Straight line graphs</u> <ul style="list-style-type: none"> - Plot and read coordinates in four quadrants - Lines parallel to the axes - Plot lines of the form $y = mx$ - Plot lines of the form $y = x + c$ - Plot lines of the form $y = mx + c$ - Plot lines of the form $x + y = a$, $y - x = a$ and $x - y = a$ 	<u>Three-dimensional shapes</u> <ul style="list-style-type: none"> - Identify and name 2-D shapes - Identify and name 3-D shapes Faces, edges and vertices - Nets of cubes and cuboids - Nets of other 3-D shapes - Plans and elevations - Find the area of 2-D shapes - Find the surface area of cubes and cuboids - Find the volume of cubes and cuboids by counting cubes - Find the volume of cubes and cuboids 	<u>Numbers</u> <ul style="list-style-type: none"> - Order of operations - Use the four operations with integers - Use the four operations with decimals - Add and subtract fractions - Multiply fractions - Divide a fraction by an integer - Divide a fraction by a fraction 	<u>Deduction</u> <ul style="list-style-type: none"> - 1-step angle problems - Angles in triangles - Angles in quadrilaterals - Multi-step angle problems - Solve problems with angles and shapes - Identify angles in parallel lines - Solve problems with angles in parallel lines (with reasons) 	<u>Enlargement and similarity</u> <ul style="list-style-type: none"> - Enlarge a shape on a grid - Enlarge a shape about a point on a grid - Enlarge a shape on coordinate axes - Describe an enlargement - Recognise similar shapes - Work out unknown lengths and angles 	<u>Probability</u> <ul style="list-style-type: none"> - Single event probability - Probabilities from Venn diagram - Probability of an event not happening - Probability experiments - Expected outcomes
	<u>Forming and solving equations</u> <ul style="list-style-type: none"> - Solve 1- and 2-step equations - Solve equations with brackets - Interpret inequalities - Represent inequalities - Solve 1-step inequalities - Solve inequalities with more than one step 	<u>Constructions and congruency</u> <ul style="list-style-type: none"> - Measure and draw angles up to 180° - Measure and draw angles between 180° and 360° - Draw circles and parts of circles - Draw SAS triangles - Draw ASA triangles - Draw SSS triangles Understand congruency - Recognise a pair of congruent triangles 	<u>Using percentages</u> <ul style="list-style-type: none"> - Simple Fraction, decimal and percentage equivalence - Find a percentage of an amount - Find the whole given a percentage - Increase or decrease an amount by a percentage - Express one quantity as a percentage of another - Solve percentage problems 	<u>Rotation and translation</u> <ul style="list-style-type: none"> - Identify the order of rotational symmetry of a shape - Recognise line symmetry of shapes - Rotate a shape about a point on the shape - Rotate a shape about a point not on the shape - Translate points and line segments - Translate a shape - Describe a translation 	<u>Solving ratio & proportion problems</u> <ul style="list-style-type: none"> - Direct proportion - Conversion graphs - Best buy problems - Share in a ratio - Solve ratio problems - Inverse proportion 	<u>Algebraic representation</u> <ul style="list-style-type: none"> - Expand brackets and simplify (numerical coefficient of bracket) - Expand brackets (algebraic coefficient of bracket) - Expand double brackets - Plot quadratic graphs
	<u>Testing conjectures</u> <ul style="list-style-type: none"> - Factors and multiples - Prime numbers - Write a number as a product of its prime factors - Create Venn diagrams - Interpret Venn diagrams 		<u>Maths and money</u> <ul style="list-style-type: none"> - Earnings Taxes Bills Budgets Loans Holidays (covered in PSHE also) 	<u>Pythagoras' Theorem</u> <ul style="list-style-type: none"> - Evaluate squares and square roots - Solve equations with squares and square roots - Identify the hypotenuse of a right-angled triangle - Calculate the hypotenuse of a right-angled triangle - Calculate a shorter side of a right-angled triangle - Calculate an unknown side of a right-angled triangle 	<u>Rates</u> <ul style="list-style-type: none"> - Time Speed - Speed, distance and time (non-calculator) - Speed, distance and time (calculator) - Interpret distance–time graphs - Draw distance–time graphs 	<u>Circle geometry</u> <ul style="list-style-type: none"> - Find the circumference of a circle - Find the area of a circle - Find the area of composite shapes - Volume of prisms - Volume of cylinders
						<u>Polygon Geometry</u> <ul style="list-style-type: none"> - Exterior angles in regular polygons - Interior angles in regular polygons - Angle problems in regular polygons - Angle problems in any polygon

Mathematics – KS4 Curriculum Highlighted points denote essential learning

Year 10	Topic/Unit (8 weeks)	Topic/Unit (7 weeks)	Topic/Unit (7 weeks)	Topic/Unit (6 weeks)	Topic/Unit (4 weeks)	Topic/Unit (7 weeks)
	Using number	Developing Algebra	Geometry / Proportions and Proportional Change	Proportions and Proportional Change	Developing data	Similarity/Trigonometry
Subject Content	<p>Non-calculator methods</p> <ul style="list-style-type: none"> Mental/written methods of integer/decimal of the four operations The four rules of fraction arithmetic Rounding to decimal places and significant figures Estimating answers to calculations <p>Types of number and sequences</p> <ul style="list-style-type: none"> Understand the difference between factors and multiples Understand primes and express a number as a product of its prime factors Find the HCF and LCM of a set of numbers Describe and continue arithmetic and geometric sequences Find the rule for the n the term of a linear sequence <p>Indices and Roots</p> <ul style="list-style-type: none"> Square and Cube numbers Powers of 10 and standard form The addition and subtraction rules for indices 	<p>Representing solutions of equations and inequalities</p> <ul style="list-style-type: none"> Understand the meaning of a solution Form and solve one-step and two-step equations Draw straight line graphs Find solutions to equations using straight line graphs <p>Manipulating expressions and functions</p> <ul style="list-style-type: none"> Simplify algebraic expressions Use function machines Substitute into expressions and formulae Use function notation <p>Expanding, factorising and reasoning</p> <ul style="list-style-type: none"> Expand and factorise with a single bracket Expand binomials Simplify complex expressions Find the rule for the n th term of a linear sequence Use rules for sequences 	<p>Angles & bearings</p> <ul style="list-style-type: none"> Understand and use the angle properties of parallel lines Find missing angles using corresponding and alternate angles Solve angle problems in triangles including between parallel lines and isosceles triangles (complex diagrams) Calculate the exterior and interior angles of regular polygons Calculate the interior and exterior angles of polygons Explain why some polygons fit together and others do not <p>Working with circles</p> <ul style="list-style-type: none"> Recognise and label parts of a circle <p>Probability</p> <ul style="list-style-type: none"> Find probabilities using equally likely outcomes Use the property that probabilities sum to 1 Find probabilities from tables, Venn diagrams and frequency trees Construct and interpret sample spaces for more than one event Use tree diagrams for dependant/independent events 	<p>Ratios & fractions</p> <ul style="list-style-type: none"> Compare quantities using a ratio Link ratios and fractions Share in a ratio (given total or one part) Use ratios and fractions to make comparisons Link ratios and graphs Solve problems with currency conversion Link ratios and scales Use and interpret ratios of the form $1 : n$ and $n : 1$ Solve 'best buy' problems Combine a set of ratios <p>Percentages and Interest</p> <ul style="list-style-type: none"> Convert and compare fractions, decimals and percentages Work out percentages of amounts (with and without a calculator) Increase and decrease by a given percentage Express one number as a percentage of another Calculate simple and compound interest 	<p>Collecting, representing and interpreting data</p> <ul style="list-style-type: none"> Understand populations and samples Primary and secondary data Construct and interpret frequency tables and frequency polygons Construct and interpret line and bar charts Construct pie charts Criticise charts and graphs Find and interpret averages from a list/table Construct and interpret stem-and-leaf diagrams Construct and interpret scatter graphs Draw and use a line of best fit <p>Transforming</p> <ul style="list-style-type: none"> Perform and describe line symmetry and reflection Perform and describe rotation/rotational symmetry Perform and describe translations of shapes Perform and describe enlargements of shapes Identify transformations of shapes 	<p>Congruence and similarity</p> <ul style="list-style-type: none"> Identify similar shapes Work out missing sides and angles in a pair given similar shapes Use parallel line rules to work out missing angles Establish a pair of triangles are similar Understand the difference between congruence and similarity <p>Trigonometry</p> <ul style="list-style-type: none"> Explore ratio in similar right-angled triangles Work fluently with the hypotenuse, opposite and adjacent sides Use the tangent ratio to find missing side lengths Use the sine and cosine ratio to find missing side lengths Use sine, cosine and tangent to find missing side lengths Use sine, cosine and tangent to find missing angles Calculate sides in right-angled triangles using Pythagoras' Theorem Select the appropriate method to solve right-angled triangle problems Work with key angles in right-angled triangles

Entry Level Certificate – Students will be given the opportunity to complete Entry Level papers, if appropriate, during Year 10. All papers to be completed before Autumn term in Year 11

Year 11	Topic/Unit (8 weeks)	Topic/Unit (7 weeks)	Topic/Unit (7 weeks)	Topic/Unit (6 weeks)	Topic/Unit (4 weeks)	Topic/Unit (7 weeks)
	Graphs	Algebra 2	Reasoning	Revision	Revision	Examinations
Subject Content	<p>Using graphs</p> <ul style="list-style-type: none"> Construct and interpret conversion graphs Construct and interpret other real-life straight-line graphs Interpret distance/time graphs Construct distance/time graphs Construct and interpret speed/time graphs <p>Non-linear graphs</p> <ul style="list-style-type: none"> Plot and read from quadratic graphs Plot and read from cubic graphs Plot and read from reciprocal graphs Recognise graph shapes Identify and interpret roots and intercepts of quadratics <p>Gradients & lines</p> <ul style="list-style-type: none"> Equations of lines parallel to the axis Plot straight line graphs Interpret $y = mx + c$ Find the equation of a straight line from a graph 	<p>Expanding & factorising</p> <ul style="list-style-type: none"> Expand and factorise with a single bracket Solve equations equal to 0 <p>Changing the subject</p> <ul style="list-style-type: none"> Solve simple linear equations Solve inequalities Form and solve equations and inequalities in the context of shape Change the subject of a simple formula Change the subject of a known formula Change the subject of a complex formula 	<p>January – Mocks</p> <ul style="list-style-type: none"> Answer Analysis Mock review <ul style="list-style-type: none"> Multi step questions Problem solving 	<p>Revision</p> <ul style="list-style-type: none"> “Show that” with number “Show that” with algebra “Show that” with shape “Show that” with angles “Show that” with data “Show that” with congruent triangles <ul style="list-style-type: none"> Exam techniques and preparation 	<p>Revision</p> <ul style="list-style-type: none"> Personalised revision plan for all pupils leading up to examinations. 	<p>Examinations</p>