St Cuthbert Mayne School Curriculum Map 2023-2024

Department: Maths

Year 8

Department Intent and overview We believe that with the right teaching, all children can make exceptional progress and are capable of achieving a strong pass or better at GCSE. To achieve this goal requires high quality teaching supported by a well-structured curriculum in the context of strong whole school systems. In every lesson, you'll be doing maths within the first few seconds with our 'Do Now' tasks. You will develop your skills in Number, Algebra, Geometry, Ratio and Proportion, and Probability and Statistics as outlined in the National Numeracy Strategy. There are ten teachers in the department – we are a mix of young and old, new and experienced. There are ten teachers in the department – we are a mix of young and old, new and experienced. We are led by Mr Harvey and ably assisted by Miss Stronkova (2i/c) and Mr Whitehead (Maths Lead practitioner). We are passionate about our subject and seeking the best for the students we teach. There is always an opportunity for students to get extra help with their Maths studies from any of the teachers in the department and we run regular Maths café lunchtime sessions. We follow the ESW Multi Academy trust SOW for years 7 and 8. It has been identified that students come to secondary having had years of teaching on written methods, place value etc. This sort of KS2 prerequisite knowledge will be identified on the scheme so the teacher is aware of it then can build upon this knowledge for a smoother transition between primary and secondary education.

Key Stage 3 Curriculum Summary

Autumn Term 1

Topic/ Unit	1: Rules of Indices	2 & 3. Standard Form Calculations	4: Expanding and factorising expressions	5: Solving linear equations with brackets	6: Arc length and sector area	
Knowledge (Content covered)	Rules of indices leading to standard form **Prior knowledge links** Use of square numbers in Pythagoras - Y7 Cycle 1	Standard form – meaning and conversion – calculations applications to science **Prior knowledge links** Powers of ten and place value (KS2) Meaning of index notation (Y7C3) Rules of indices (week 1 this cycle)	Factorise & expand single brackets **Prior knowledge links** Balancing equations from Year 7 cycle 3	Solving equations using balancing (linear brackets)	Area of circle + area of a sector (link with fractions) **KS2/Prior knowledge links** Y7C2 Circumference of a circle. Y7C3 Area of a circle	
Skills	- Can recall square up to 15^2 and cube numbers up to 5^3 and understand the inverse. - Can use the multiplication and division rule for simplifying indices(integer and algebraic). - Understand negative indices as division (in preparation for standard form). - Can raise a bracket to a	- Can convert large numbers to standard form and vice versa. - Can convert small numbers to standard form and vice versa. - Can recognise when a number is written in standard form - Can order and compare numbers in standard form. - Can use standard form functions on a calculator - Can solve multiplication and	- Can expand single brackets with two terms and no powers - Can expand single brackets involving powers and more than two terms. - Can expand and simplify two or more sets of single brackets - Can identify the factors of a single term (eg. $12x^2y$) - Can factorise expressions containing two terms and no powers - Can factorise expressions	- Can solve linear equations containing a single bracket on either side. - Can solve linear equations containing more than one single bracket eg. 3(x-4)+2x=4(5x+6)	- Can find non trivial fractions of any amount using a calculator (eg. 47/360 of 72.5) - Can calculate the area of a sector - Can calculate the length of an arc - Can leave answers in terms of π and work with	

					exact values	
	power e.g $(x^3)^5=x^{15}$ ● Recognise and apply $a^0=1$	division calculations involving standard form. ● Can solve addition and subtraction calculations involving standard form. ● Can substitute values in standard form into expressions and formula	containing more than two terms and powers. ● Understands the difference between an equation and an identity and can use the triple equals sign correctly.		exact values	
Assessment	Y8C1 Indices MA1.docx Y8C1 Indices MA2.docx	Y8C1 Converting Standard form MA1.docx Y8C1 Converting Standard form Y8C1 Calculating Standard form MA1.docx Y8C1 Calculating Standard form MA2.docx Y8C1 Standard form in context MA1.docx Y8C1 Standard form in context MA2.docx	Y8C1 linear brackets MA1.docx Y8C1 linear brackets MA2.docx	Y8C1 Solving with brackets MA1.docx Y8C1 Solving with brackets MA2.docx	N/A	
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Autumn Term 2

Topic/ Unit	7:Area and Pythagoras	8: Data (Averages & Spread)	9: Frequency Distributions	10 & 11: Grouped Data	Assessment	
Know ledge (Content covered)	**Area + Pythagoras** **Prior knowledge links** Pythagoras (Y7C1) and Area (Y7C2)	Data – Averages and spread **Prior knowledge links** Can calculate Mean (KS2)	Data – Averages and spread **KS2/Prior knowledge links** Students can work with data in tables. Averages and spread (Y8C1)	Using grouped data – reading tables and finding averages. **KS2/Prior knowledge links** Inequality notation (< and >) is taught in year 2.		
Skills	- to recognise when to use Pythagoras in the context of the area of the following shapes ○ Finding the height or base of scalene, right angled, isosceles and equilateral triangles ○ Finding the width or height of a square or rectangle given the diagonal. ○ Finding the height of a trapezium or parallelogram	- Can explain that a set of data can be summarised by an average and a measure of spread. - Can calculate mean(revision), median, mode and range from a list - Can compare data sets using averages and the range. - Can identify missing values given the mean - Can identify missing values given multiple averages or range	- Can convert between a table and ordered raw data - Can find mean, median, mode and range from a frequency distribution - Can find mean, median, mode and range from KS2 statistical diagrams - Can distinguish between averages and measures of spread - Can compare data sets using statistical measures	- Can put data into a grouped frequency distribution - Can interpret inequality notation in this context and explain how it eliminates gaps or overlaps between classes. - Can find estimate of mean, median class, modal class and range from a grouped frequency distribution - Can explain why statistical measures of grouped data are estimates - Can distinguish between averages and measures of spread - Can compare data sets using statistical measures		
Assess ment	Y8C1 Area and Pythagoras MA1.docx	Y8C1 Averages and spread Y8C1 Averages and spread				

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Spring Term 1

Topic /Unit	12: Forming and Solving Equations with Perimeter	13 & 14: Straight Line Graphs	15 & 16: Proportion	Assessment	
Knowledge (Content covered)	Forming and solving equations (balancing) with perimeter **KS2 knowledge links** Perimeter is introduced in Y3 and by Y6, students are calculating perimeters of complex rectilinear shapes. Solving equations was last taught in Y8 Cycle 1 week 5. Perimeter is taught in Y7 Cycle 2 week 6.	Straight lines finding equation from graph Straight lines – parallel and perpendicular: Teacher discretion **KS2 knowledge links** Plotting coordinate in the first quadrant (Year 4). Plotting in all four quadrants and linking this to other applications (Years 5 and 6).	Unitary method – value for money Unitary method – units' conversion, scales and exchange rates		
Skills	• Can form and solve equations in the context of perimeter including problems where: ○ The perimeter is a known value. ○ The perimeter is the same as the perimeter of another shape.	• Can plot and name horizontal and vertical lines • Can recognise a line as solution sets for an equation • Can determine if a point lies on a line given the equation • Can plot lines of the form y=mx+c using gradient intercept method or a	• Can use a table to identify multiplicative relationships between two quantities in direct proportion. • Understands the importance of 1 in solving direct proportion problems (the unitary method) • Can solve direct proportion problems (using a table) including: ○ Can solve simple proportion		

	○ The perimeter is related to the perimeter of another shape (ie. it is 3 times larger etc.) ○ The perimeter is the same as the perimeter of another shape. ○ The perimeter is related to the perimeter of another shape (ie. it is 3 times larger etc.)	table. ● Can plot lines given in the form y=a(bx+c) by expanding the brackets first (link with linear brackets) ● Can identify gradient or intercept from the equation. ● Can identify simple integer gradients via a step method and relate this to y=mx+c ● Can calculate more complex gradients by drawing a triangle and using the formula change in y/change in x ● Can identify y-intercept ● Can write the equation of a line given the graph	problems ○ Can calculate the best value offer by calculating the cost of one item ○ Can adjust recipes by calculating ingredients for one person ○ Can convert between currencies by using or calculating the conversion of £1 (or other unit) ● Can solve direct proportion problems by selecting an efficient method by using HCF or LCM instead of 1 ● Can solve simple inverse proportion problems. ● Can work with graphical representations of direct proportion (eg/currency conversion graphs etc) ● Can convert between metric units (this turns up in cycle 3 volume) ● solve simple proportion problems		
Assessment	Y8C2 form and solve with perimeter MA1.docx	Y8C2 straight lines MA1.docx Y8C2 straight lines MA2.docx Y8C2 gradients and y=mx+c MA1.docx Y8C2 gradients and y=mx+c MA2.docx	Y8C2 Unitary Method MA1.docx Y8C2 Unitary Method MA2.docx Y8C2 Best buy MA1.docx Y8C2 Best buy MA2.docx		
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Spring Term 2

Topic/ Unit	17 & 18: Introducing quadratics Manipulating quadratics	19 & 20: Volume	21 & 22: Factorising Quadratics	23: Parallel and Perpendicular Lines	Assessment
Know ledge (Content covered)	Plotting quadratic graphs Expanding double brackets – include triple brackets for top sets **Prior knowledge links** Y8C2 factorising and expanding linear brackets Plotting graphs with two variables(KS2), Y8C2 work on linear graphs	Volume – cuboids and composite shape Volume of a prism **KS2 knowledge links** Volume has been taught from Y1/2. Calculating volume of cuboids with a variety of units is a y5/6 topic.	Factorising quadratics Quadratics solve by factorising **Prior knowledge links** Expanding brackets - earlier in this cycle	Straight lines – parallel and perpendicular: Teacher discretion **KS2 knowledge links** (Year 3) Can identify pairs of perpendicular and parallel lines.	
Skills	- Can plot quadratic graphs using table mode - Can expand and simplify double brackets - Can identify the difference between double and single brackets and apply the correct technique. - Can plot quadratic graphs without using a calculator	- Can describe volume as a measure of 3D space and the unit of measurement as the cube. - Can distinguish between the operation (eg. 4^3) and the unit ($4cm^3$) - Can identify prisms - Can recall and apply the volume of a prism formula. ○ Can calculate the volume of a cuboid and shapes made from cuboids. ○ Can calculate the volume of any prism including (triangle and trapezium	- Can factorise expressions of the form x^2+bx+c - Can solve a quadratic equation of the form $x^2+bx+c=0$ by factorising - Can explain why factorising makes the solutions clear. - Can distinguish between linear and quadratic equations and can apply the correct technique for solving.	- Can identify from equations lines which are parallel - Can use and explain the terms perpendicular, reciprocal and negative reciprocal - Can identify from equations lines which are perpendicular - Can solve problems involving parallel and perpendicular lines	

		based prisms). ○ Can solve 'real life' problems involving prisms.			
Assess ment	Y8C3 quadratic graphs MA1.docx Y8C3 quadratic graphs MA2.docx Y8C3 expanding brackets MA1.docx	Y8C3 Volume MA1.docx Y8C3 Volume MA2.docx	Y8C3 expanding and factorising MA1.docx Y8C3 expanding and factorising Y8C3 Solve Quadratics MA1.docx Y8C3 Solve Quadratics MA2.docx	Y8C2 Parallel and perpendicular MA1.docx	
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Summer Term 1

Topic /Unit	25: Prime decomposition	26:Volume and units	27:Basic probability	28 &29: Angles - Polygons	30 & 31: Equations in context
Know ledge (Content covered)	Prime decomposition, HCF and LCM **KS2 knowledge links:** factors, multiples, primes, HCF and LCM by listing.	Volume of a cylinder **KS2 knowledge links** none	Basic probability + listing strategies **KS2 knowledge links** none	Angles in Polygons (exterior and interior) Link with ratio and equations **KS2 knowledge links** angle sum of a triangle is 180, angles around a point sum to 360, angles on a straight line sum to 180, vertically opposite angles are equal	Forming and solving equations from volume Forming and solving equations from sequences
Skills	- Can state the definition of a prime number as "a number with exactly two distinct factors" - Can list the prime numbers up to 29 - Can write a number as a product of prime factors - Can find the HCF and LCM using prime factors - Can choose the most appropriate strategy to find the HCF and LCM,(prime factors of listing factors/multiples) - Using prime factors to assist mental calculations	- Recognises a cylinder as a prism and can relate the volume formula to the general formula for the volume of a prism. - Can calculate the volume of a cylinder - Can find the dimensions of a cylinder by working backwards from the volume - Can convert between units of volume, area and length eg. m^3 and cm^3	- Can write and place probability on a number line either as words, decimals, fractions or percentages. - Can find the probability of single events using theoretical probabilities - Understands the distinction between theoretical and experimental probability. - Can apply the fact that the probability of mutually exclusive events sum to 1. - Can list outcomes systematically and calculate probabilities using: - tables - frequency trees	- Can identify the interior and exterior angles of a polygon on a diagram. - Knows the sum of the exterior angles of any polygon is 360. - Can calculate the angle sum of any polygon - Can find the size of angles in a regular polygon - Given the interior or exterior angle of a regular polygon, can find the number of sides. - Can solve problems involving interior or exterior angles.	- Recap objectives - Can represent an unknown algebraically - Can solve linear equations by balancing - Can check a solution by substitution - Can form and solve linear equations in the context of volume. - Can form and solve linear equations in the context of sequences.

			○ sample space diagrams		
Assessment	Y8C3 Prime factors MA1.docx Y8C3 Basic factors multiples MA1.docx	Y8C3 Cylinders and converting units MA1.docx Y8C3 Cylinders and converting units MA2.docx	Y8C3 Basic Probability MA1.docx Y8C3 Sample Space Diagrams MA1.docx	Y8C3 Polygon angles MA1.docx Y8C3 Polygon angles MA2.docx Y8C3 Polygon angles MA3.docx Y8C3 LPA Polygon angles	
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Summer Term 2

Topic/ Unit	32: Surface area	33: Pie charts	34 & 35: Scale drawings and bearings	Assessment	
Knowledge (Content covered)	Surface area of cuboids and prisms **KS2 knowledge links** work done in KS2 on area and in Y7 but not explicitly on surface area.	Pie charts **KS2 knowledge links** constructing pie charts in Y6	Angles – bearings (measuring and calculating) **Prior knowledge links** measuring and drawing angles, using a ruler to draw and interpret scale drawings (Y5 and Y6).		
Skills	● Can find the surface area of cuboids and other right prisms ● Can apply Pythagoras to find missing side lengths in order to find surface area	● Can construct a pie chart from a frequency table or list of data. ● Can complete a frequency table given a pie chart and the number of items in a section of the pie (or the whole pie. ● Can interpret and compare pie charts.	● Knows that a bearing is an angle measured clockwise from north. ● Relate angular measure to the cardinal compass directions and understand the applications to navigation. ● Can construct and measure bearings to describe journeys ● Can solve problems on a map involving bearings and distances using scale drawings. ● Can apply the parallel line angle facts to solve bearing problems by calculation.		
Assessment	Y8C3 Surface Area MA1.docx Y8C3 Surface Area MA2.docx Y8C3 LPA Surface Area MA1.docx	Y8C4 Pie Charts MA1.docx Y8C4 Pie Charts MA2.docx Y8C4 Pie Charts MA3.docx			
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