

# St Cuthbert Mayne School Curriculum Map 2023-2024



## Department: Maths

### Year 7

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. 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: Calculators, rounding and estimating	2 & 3: Area	4 & 5: Fractions	6 & 7: Pythagoras into Autumn 2
<b>Knowledge (Content covered)</b>	Using a scientific calculator and rounding to any place value – estimating answers recurring decimal notation  <b>KS2 knowledge links:</b> Place value	Area – rectangles, triangle and composite shapes  Area – parallelograms and trapezia  <b>KS2 knowledge links</b> finding area of rectangles and triangles and composite shapes, converting metric units	Fractions of an amount Find fraction of whole Find whole given fraction Adding and subtracting fractions and mixed numbers, HCF and LCM  <b>KS2 knowledge links:</b> Multiples (and LCM), factors (and HCF), concept of a fraction, understanding of numerator and denominator, Recognise and use equivalent fractions. Other detail in the objectives above.	Pythagoras (not taught as $a^2+b^2=c^2$ at this stage) Mental arithmetic check then move on to calculator work. Pythagoras - Length of line segments and midpoints  <b>KS2 knowledge links:</b> Knowledge of square numbers and notation. Non calculator multiplication, addition and subtraction. Plotting coordinates in 4 quadrants, knowledge of square numbers.
<b>Skills</b>	<ul style="list-style-type: none"> <li>● Can round numbers to the nearest power of 10 or to any number of decimal places</li> <li>● Students understand recurring decimal notation</li> <li>● Students can explain what an irrational number is and give an example.</li> <li>● Can use the following calculator functions:                             <ul style="list-style-type: none"> <li>○ fractions and mixed numbers</li> <li>○ square and square root</li> <li>○ memory</li> <li>○ reset</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Can describe area as a measure of flat space, measured in squares.</li> <li>● can find area of rectangles, triangles and composite shapes</li> <li>● can use and identify appropriate units (<math>\text{cm}^2</math>, <math>\text{m}^2</math>, <math>\text{km}^2</math>,...)</li> <li>● Can find the area of a parallelogram</li> <li>● Can recall and use formula for the area of a trapezium</li> <li>● Can find missing dimensions from given area</li> </ul>	<ul style="list-style-type: none"> <li>● Can find unit and non unit fractions of amounts including within a context [Y4]</li> <li>● Can find the whole amount given a fraction <b>[New in KS3]</b></li> <li>● Understands that "2/3 of 12" is equivalent to "2/3 x 12" [Y5]</li> <li>● Can find a fraction of an amount using a calculator (ensure students can do this with fractions such as 234/360 to prepare them for fractions of a circle) <b>[New in KS3]</b></li> <li>● Can multiply fractions                             <ul style="list-style-type: none"> <li>○ Can multiply an integer by a fraction [Y5]</li> <li>○ Can multiply two fractions [Y6]</li> </ul> </li> <li>● Can divide fractions                             <ul style="list-style-type: none"> <li>○ Can divide an integer by a fraction <b>[New</b></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Can identify the hypotenuse of a right angled triangle</li> <li>● Can explain Pythagoras theorem in words</li> <li>● Can use Pythagoras' theorem to find missing sides of a right angled triangle.</li> <li>● Can solve problems where 2 or more triangles are joined.</li> <li>● Can use Pythagoras to find missing lengths in isosceles triangles.</li> <li>● Can use Pythagoras to find the length of a line segment given the coordinates of the end points (all four quadrants).</li> <li>● Can use Pythagoras to check that</li> </ul>

			<p><b>in KS3]</b></p> <ul style="list-style-type: none"> <li>○ Can divide a fraction by an integer [Y6]</li> <li>○ Can divide a fraction by a fraction [<b>New in KS3]</b></li> <li>● Understands the equivalence between division and multiplication. For example that <math>x\frac{1}{2}</math> is equivalent to <math>\div 2</math>)</li> <li>● Can convert between fractions and mixed numbers. [Y5]</li> <li>● Can add and subtract <ul style="list-style-type: none"> <li>○ fractions with different denominators [Y5]</li> <li>○ mixed numbers [Y6]</li> </ul> </li> <li>● Can add and subtract fractions and mixed numbers in context [<b>New in KS3]</b></li> <li>● Can multiply and divide fractions and mixed numbers in context [<b>New in KS3]</b></li> </ul>	<p>a triangle is right angled.</p> <ul style="list-style-type: none"> <li>● Can explain what a Pythagorean triple is and give an example.</li> <li>● Can find the midpoint of a line segment.</li> </ul>	
<b>Assessment</b>	<p>Y7C1 Calculator and rounding MA1.docx Y7C1 Calculator skills MA1.docx</p>	<p>Y7C1 Basic area MA1.docx Y7C1 Basic area MA2.docx  Y7C1 Harder area MA1.docx Y7C1 Harder area MA2.docx</p>	<p>Y7C1 Fractions of an amount MA1.docx Y7C1 Add Subtract Fractions MA1.docx Y7C1 Multiply Divide Fractions MA1.docx Y7C1 Converting Mixed Improper Fractions Y7C1 Add Subtract Improper Fractions Y7C1 Fractions in context MA1.docx Y7C1 Fractions in context MA2.docx</p>	<p>Y7C1-2 Pythagoras MA1.docx Y7C1-2 Applications of Pythagoras MA1.docx</p>	
<b>Gatsby 4</b>					

## Autumn Term 2

Topic/ Unit	6 & 7: Pythagoras into Autumn 2	8 : Mental percentages	9 : Percentage change	10 & 11: Irrational numbers Non calculator Pythagoras	Assess ments
Knowledge (Content covered)		Percentages – mental methods  <b>KS2 knowledge links</b> Calculating percentages of amounts. Writing percentages as simplified fractions	Percentage increase and decrease  <b>KS2 knowledge links</b> Calculating percentages of amounts. Writing percentages as simplified fractions	Exact Pythagoras (recap surd form from calculators) Types of number, Squares and simplifying basic surds Pythagoras no calculator	
Skills		<ul style="list-style-type: none"> <li>• Understand that <i>a percentage is a fraction out of 100</i> and can write any percentage as a fraction) <b>KS2-Y5</b></li> <li>• Understand that a percentage greater than 100% is an improper fraction (and is possible)</li> <li>• Can relate key percentages to their fractional equivalents (50%, 25%, 75%, 10%) <b>KS2-Y5</b></li> <li>• Can calculate simple percentages of amounts without a calculator (Using a proportion table). <b>KS2-Y5/6</b></li> <li>• use key percentages to find other percentage amounts e.g. use of 50% and 10% to find 1%, 5%, 15%, 65%, 120% etc. <b>KS2-Y6</b></li> <li>• find any percentage using a non-calculator method.</li> <li>• Use percentage in the context of area.</li> </ul>	<ul style="list-style-type: none"> <li>• Can increase an amount by a percentage (without a calculator)</li> <li>• Can decrease an amount by a percentage (without a calculator)</li> <li>• Can write one value as a percentage of another (with or without a calculator)</li> <li>• Can calculate simple percentage change e.g. 20 to 25 is a 25% increase, 25 to 20 is a 20% decrease</li> </ul>	<ul style="list-style-type: none"> <li>• Understands that irrational numbers cannot be written as fractions or decimals and that some can be left in root form.</li> <li>• Can square surds</li> <li>• Can simplify surds by finding a square factor (Assessment will be limited to 4, 9, 25 or 100)</li> </ul>	
Assess ment		Y7C2 Non cal Percentages MA1.docx Y7C2 Non cal Percentages MA2.docx Y7C2 Non cal Percentages MA3.docx	Y7C2 Percentage Inc Dec MA1.docx Y7C2 Percentage Inc Dec MA2.docx Y7C2 Percentage Inc Dec MA3.docx	Y7C1-2 Non Calc Pythagoras MA1.docx	
Gatsby 4					

## Spring Term 1

Topic/ Unit	12: Pythagoras in context	13: Perimeter	14: Circle Circumference	15 & 16: Negative numbers	
<b>Knowledge (Content covered)</b>	Exact Pythagoras (recap surd form from calculators) Types of number, Squares and simplifying basic surds Pythagoras no calculator	Perimeter (include Pythagoras for triangles) – link with percentage/fractions  <b>KS2 knowledge links</b> Finding the perimeter of simple 2D shapes	Circumference of a circle + arc length	Negative numbers Prime decomposition, HCF and LCM  <b>KS2 knowledge links:</b> ordering negative numbers, students will have encountered the number line and negative numbers in the context of temperature	
<b>Skills</b>	<ul style="list-style-type: none"> <li>● Can draw a diagram of a problem and identify the need for Pythagoras.</li> <li>● Can use Pythagoras to solve context problems where the right angled triangle is not obvious. Eg.               <ul style="list-style-type: none"> <li>○ Ladder problems (finding length, height up wall or distance from wall)</li> <li>○ Kite problems (finding height of kite, length of string etc.</li> <li>○ Problems involving the diagonal of rectangle.</li> <li>○ Problems where the right angle is formed by the cardinal compass directions (North, South, East, West)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Can calculate the perimeter of regular polygons.</li> <li>● Can calculate the perimeter of compound shapes.</li> <li>● Can calculate the perimeter of triangles and compound shapes involving triangles.</li> <li>● Can work backwards from the perimeter to find unknown measurements.</li> </ul>	<ul style="list-style-type: none"> <li>● Can label parts of a circle. (radius, diameter, chord, circumference, sector, segment, centre)</li> <li>● Recognises the significance of pi</li> <li>● Can calculate the circumference given the diameter</li> <li>● Can calculate the circumference given the radius</li> <li>● Can calculate the arc length or perimeter of half or quarter circles</li> <li>● Can calculate the radius or diameter given the circumference.</li> </ul>	<ul style="list-style-type: none"> <li>● Can add and subtract positive and negative integers</li> <li>● Can multiply and divide positive and negative integers</li> <li>● Can explain when a calculation involving two negative numbers gives a positive answer and when it does not.</li> <li>● Can identify pairs of numbers that sum to zero</li> </ul>	
<b>Assessment</b>	Y7C1-2 Applications of Pythagoras MA2.docx	Y7C2 Perimeter MA1.docx Y7C2 Perimeter MA2.docx	Y7C2 Circumference MA1.docx Y7C2 Circumference MA2.docx	Y7C3 Add and subtract negative numbers Y7C3 Multiply and divide negative numbers Y7C3 Negative numbers MA1.docx Y7C3 Add and subtract negative fractions Y7C3 Multiply and divide negative fractions	
<b>Gatsby 4</b>					

## Spring Term 2

Topic/ Unit	17: Fractions, percentages, area and perimeter	18 - 20: Algebraic notation Solving Equations	21 & 22: Substitution	23: Angles - measure and construct	
<b>Knowle dge (Conten t covered )</b>	Fractions, percentages, area and perimeter	Algebraic notation and simplifying  <i>KS2 knowledge links the KS2 curriculum implies there will be some teaching of algebraic notation. It's pretty mysterious so don't assume much</i>	Substitution with negatives and fractions Balancing equations – including area examples  <i>KS2 knowledge links: use of simple formulas, BIDMAS</i>	Angles: names and notation, measuring angles, pie charts, constructing triangles	
<b>Skills</b>	<ul style="list-style-type: none"> <li>Can apply knowledge of fractions and percentage to problems involving area or perimeter.</li> </ul>	<ul style="list-style-type: none"> <li>Understands that a variable quantity can be represented by a letter</li> <li>Understands algebraic notation including                             <ul style="list-style-type: none"> <li>3a means 3 x a or a+a+a,</li> <li>ab means a x b,</li> <li>a/b means a divided by b</li> <li>a<sup>3</sup> means a x a x a</li> </ul> </li> <li>Can explain what a term is and identify the terms in an expression.</li> <li>Can Simplify algebraic expressions (or equations) by collecting like terms.</li> <li>Can use knowledge of negative numbers to simplify expressions containing positive and negative values.</li> </ul>	<ul style="list-style-type: none"> <li>Knows how to evaluate an expression by substitution</li> <li>Knows how to substitute into a formula and interpret the result.</li> <li>Can substitute and evaluate expressions and formulae involving                             <ul style="list-style-type: none"> <li>positive integers</li> <li>negative integers</li> <li>fractions</li> <li>correct order of operations including brackets and small powers</li> </ul> </li> <li>Can generate a range of outputs from the same expression/formula by substituting different values (and has substituted into expressions/formulae in the form of nth term rules and y=mx+c).</li> </ul>	<ul style="list-style-type: none"> <li>Can construct and measure angles accurately</li> <li>Can describe points, line segments, angles and polygons using correct notation</li> <li>Can construct triangles(by SAS, ASA and SSS) using ruler, compass or protractor</li> </ul>	
<b>Assessm ent</b>			Y7C3 Substitution MA1.docx Y7C3 Substitution MA2.docx Y7C3 Balancing MA1.docx Y7C3 Balancing MA2.docx	Y7C3 Shape notation and construction Y7C3 Shape notation and construction	

Gatsby 4					
----------	--	--	--	--	--

## Summer Term 1

Topic/ Unit	24 & 25: Angles - parallel lines	26: Angles & Algebra	27 & 28: Ratio	29: Rearranging	
<b>Knowledge (Content covered)</b>	<p>Angles – parallel line facts</p> <p><b>KS2 knowledge links</b> Y6 angles around a point, on a line and vertically opposite. Y5 estimate, draw and measure, angles around a point, on a line etc. Y4 types of triangle, Y6 Angle sum of triangles, quadrilateral and regular polygons . Y3 angles as property of shape or description of turn, Acute and Obtuse. Y2 Angles as measure of turn.</p>	Algebra + Angles	<p>Ratio – simplifying and sharing</p> <p>Ratio – relation to fractions,</p> <p><b>KS2 knowledge links</b> times tables and fractions of amounts, ratio notation does not seem to be used in KS2</p>	Rearranging formula	
<b>Skills</b>	<ul style="list-style-type: none"> <li>● Can identify the groups of identical angles formed when a line (transversal) crosses two or more parallel lines.</li> <li>● Can solve angle problems involving parallel lines. Including problems containing:               <ul style="list-style-type: none"> <li>○ a single or multiple transversals</li> <li>○ split angles</li> </ul> </li> <li>● Can solve angle problems and justify solutions using the following facts</li> </ul> <p><b>Parallel line facts</b></p> <ul style="list-style-type: none"> <li>○ corresponding angles are equal,</li> <li>○ alternate angles are equal and</li> <li>○ allied (or co-interior) angles add up to 180 degrees.</li> </ul> <p><b>KS2 facts</b></p>	<ul style="list-style-type: none"> <li>● Begin to know that many different problems can be represented as equations that can be solved.</li> <li>● Can form and solve equations from worded clues involving the language of the four operations (sum, difference, product, total, multiply, divide, add, subtract etc.)</li> <li>● Can form and solve equations to find angles in diagrams and shapes (based on the angle facts previously studied)</li> <li>● Can check answers by substitution</li> </ul>	<ul style="list-style-type: none"> <li>● Can use the bar model to represent a ratio and can identify the total and the differences.</li> <li>● Can share a quantity in a ratio</li> <li>● Can relate ratio to fractions and percentages</li> <li>● Can use ratio to find the total amount given one of the quantities.</li> <li>● Can simplify ratio with and without units</li> </ul>	<ul style="list-style-type: none"> <li>● Can rearrange simple formula by balancing involving               <ul style="list-style-type: none"> <li>○ addition and subtraction</li> <li>○ multiplication and division</li> <li>○ fractions</li> <li>○ Squares and square roots</li> </ul> </li> <li>● Can rearrange and substitute (link with negative and fractions)</li> </ul>	

	<ul style="list-style-type: none"> <li>○ Angle sum of a triangle and quadrilateral</li> <li>○ Angles on a straight line sum to 180</li> <li>○ Angles around a point sum to 360</li> <li>○ Vertically opposite angles are equal</li> </ul>				
<b>Assessment</b>		Y7C3 Form and solve with angles MA1.docx Y7C3 Form and solve worded MA1.docx	Y7C3 Ratio sharing and fractions MA1.docx Y7C3 Ratio sharing and fractions MA2.docx Y7C3 Ratio sharing and fractions MA3.docx	Y7C4 rearranging MA1.docx Y7C4 rearranging MA2.docx Y7C4 rearranging MA3.docx	
<b>Gatsby 4</b>					

## Summer Term 2

<b>Topic/ Unit</b>	<b>30: Harder Ratio</b>	<b>31: Area of a circle</b>	<b>32: Sequences</b>	<b>33: Sequences</b>	
<b>Knowledge (Content covered)</b>	Ratio – harder sharing	Area of a circle and composite shapes  <b>KS2/Prior knowledge links</b> Can identify parts of a circle: circumference, radius and diameter. Know a full turn is 360 degrees. Area of a circle (Y7 Cycle 2)	Sequences – next term and special sequences  <b>KS2 knowledge links</b> students can generate and describe linear number sequences involving whole numbers and fractions (Year 6)	Sequences and harder numbers	
<b>Skills</b>	<ul style="list-style-type: none"> <li>● Can use ratio to find the total amount given the difference between the quantities</li> <li>● Can use ratio in more complex problems involving fractions</li> </ul>	<ul style="list-style-type: none"> <li>● Can use correct vocabulary for the parts of a circle (circumference, radius, diameter)</li> <li>● Can recall and apply the</li> </ul>	<ul style="list-style-type: none"> <li>● Can find the next term for arithmetic and geometric sequences</li> <li>● Knows the language of sequences 'term, difference, arithmetic,</li> </ul>	<ul style="list-style-type: none"> <li>● Can work with sequences of numbers and sequences of patterns.</li> <li>● Can use an nth term rule to find any term in a sequence.</li> </ul>	



	<p>and percentages in a context.</p> <ul style="list-style-type: none"> <li>• Can apply ratio to problems involving angles and lengths.</li> </ul>	<p>formula for the area of a circle</p> <ul style="list-style-type: none"> <li>• Can calculate the area of quarter or half circles</li> <li>• Knows the difference between problems that require the calculation of area and the calculation of circumference.</li> <li>• Can leave answers in terms of <math>\pi</math> and work with exact values (<b>extension</b>)</li> </ul>	<p>geometric' and can use next term notation (<math>u_n, u_{n+1}</math>)</p> <ul style="list-style-type: none"> <li>• Can work out missing terms in a sequence (link to reading scales).</li> <li>• Recognise and use special sequences including triangular, square, cube, Fibonacci type, powers of 2, 10 etc...</li> </ul>	<ul style="list-style-type: none"> <li>• Has strategies to find the value of any term in a sequence. These will include <ul style="list-style-type: none"> <li>○ using a multiplication table (nth term)</li> <li>○ considering the structure of a sequence (multilink animals)</li> </ul> </li> <li>• Can represent a linear sequence on a graph</li> </ul>	
<b>Assessment</b>	Y7C4 Linked ratio MA1.docx	Y7C4 Area of circles MA1.docx Y7C4 Area of circles MA2.docx Y7C4 Area of circles - Harder MA1.docx	Y7C4 sequences MA1.docx Y7C4 sequences MA2.docx Y7C4 sequences MA3.docx	Y7C4 nth term MA1.docx Y7C4 nth term MA2.docx Y7C4 nth term MA3.docx	
<b>Gatsby 4</b>					