



Maths Rationale

Intent

We believe that all pupils are capable of understanding and doing mathematics. With good teaching, appropriate resources, effort and a 'can do' attitude all children can achieve in and enjoy mathematics.

Our aim is to develop children into confident mathematicians who are able to use mathematics as a tool in a wide range of activities both in and out of school. We want all children to acquire mastery of mathematics, with a deep understanding of mathematical principles, and continue acquiring mastery throughout their school lives, and beyond.

National Curriculum 2014 Purpose of Study

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

Implementation

We implement our approach through high quality teaching delivering appropriately challenging work for all individuals. Our pupils are taught to become competent mathematicians; we strive to embed the skills and processes necessary to enable children to use and apply their Maths learning in a variety of contexts. We aim to develop children's enjoyment of maths and provide opportunities for children to build a conceptual understanding of maths before applying their knowledge to everyday problems and challenges. Our approach to the teaching of mathematics develops children's ability to work both independently and collaboratively as part of a team.

Through mathematical talk, children develop the ability to articulate and discuss their thinking. From the beginning of their maths journey in EYFS, the children are exposed to carefully selected visual representations and manipulatives that will support their learning and deepen their understanding of mathematical concepts and processes. This approach continues to be applied as the children progress through the school.



We want pupils to be curious about problem-solving and give them opportunities to identify and recognise patterns and rules; learning the why of mathematics. This develops their skills to think independently and to have the vocabulary to explain their learning and relate these skills to real life. We also want to encourage resilient learners who accept that mistakes are a necessary step in their learning journey.

We deliver lessons that are fun and engaging. We want children to make rich connections across mathematical ideas to develop fluency, reasoning and problem solving. From Year 1 to Year 6, we use Complete Maths teaching resources as a basis for our planning. EYFS use the White Rose teaching resources as a basis for their planning. We systematically build on the sequence of lesson objectives, ensuring there is progressive coverage throughout the school. Our Curriculum is developed in a mastery style, allowing children to evolve deep conceptual understanding of Maths and giving them equal access to the curriculum, no-matter their starting point.

The Complete Maths model has gradual small step objectives for learning within all areas of Mathematics for each individual year group. At Guilden Morden we have mapped out these objectives for our mixed year groups (1/2, 3/4 and 5/6) to ensure vertical and horizontal progression for each objective. For example; when learning about place value in years 1/2, the year 1 objective of 'finding one more and one less' has been paired with the year 2 objective of 'ordering numbers'. This allows the teacher to teach the class as a whole, while helping the year 2 children call on their prior learning, which will help them with their new objective within the same lesson, as well as address any misconceptions. For more detail see the year 1 and 2 mixed place value objectives table at the end of the document.

Impact

Impact is monitored through children's work in books, reflections, teacher assessment and unit quizzes. The unit quizzes take place prior to learning and at the end of the unit. The pre-learning quizzes are used to inform the teachers planning, so that lessons can be accurately tailored to the specific needs of every child. Teacher assessment is used to inform practice and appropriate adaptations are applied, as required. Teachers provide verbal and written feedback which is 'in the moment'. Therefore misconceptions can be addressed and children's learning can be deepened with immediate effect. The maths subject leader regularly conducts 'pupil voice focus groups' in order to ensure our maths curriculum is centred on the needs of our children.



Maths Curriculum Map

Year Group	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
Reception	Getting to know you/Just like me! • Understanding of Numbers to 5 • Subitise to 5 (recognising quantities without counting) • Number Recognition and Formation • Early Addition (One More) • Comparing two quantities • Early Subtraction (One Less)	It's me, 1, 2, 3/Light and Dark • Understanding of Numbers to 5 • Counting forwards and backwards to 10 and beyond • Subitise (recognising quantities without counting) to 5 • Number Recognition and Formation • Early Addition • Early Subtraction	Alive in 5!/Growing 6, 7, 8 • Understanding of Numbers to 10 • Counting forwards and backwards to 20 and beyond • Subitise (recognising quantities without counting) to 5 • Recall number bonds to 5/10 • Addition • Addition doubles	Building 9 and 10/Consolidation • Understanding of Numbers to 10 • Counting forwards and backwards to 20 and beyond • Subitise (recognising quantities without counting) to 5 • Recall number bonds to 5/10 • Addition • Addition doubles	To 20 and beyond/First, Now, Then Consolidation and practice of skills. 'First....then.....now' stories: real-life addition/multiplication.	Find My Pattern/On the Move Consolidation and practice of skills. Pattern, shape, correlation.



		• Comparing quantities	• Exploring Bonds to 10 • Subtraction • Knowledge of more and less and distribution of quantities evenly • Comparing Quantities • Odd and Even Numbers	• Exploring Bonds to 10 • Subtraction • Knowledge of more and less and distribution of quantities evenly • Comparing Quantities • Odd and Even Numbers • Money and Time • Shape		
Year 1	Number: Place Value (counting to and across 100, Reading and writing numbers to 10 in words and numerals, Counting in steps of 2, 5 and 10, Identifying one more and one less and Number lines, other representations, and equality and inequality in words)	Number: Addition and Subtraction (Adding and subtracting up to 20, Knowing number bond and subtraction facts to 20, Using +, - and = symbols and Solving one-step addition and subtraction problems)	Measurement: Time (Knowing days, weeks, months and years, Putting events in chronological order and Beginning to tell the time to the hour and half past)	Geometry: Shape (Knowing common 2-D and 3-D shapes) Number: Fractions (Understanding 'half' as one of two equal parts and Understanding 'quarter' as one of four equal parts)	Number: Fractions (Understanding 'half' as one of two equal parts and Understanding 'quarter' as one of four equal parts)	Geometry: Position and direction (language of position, language of movement and language of turning)



	Number: Addition and Subtraction (Adding and subtracting up to 20, Knowing number bond and subtraction facts to 20, Using +, - and = symbols and Solving one-step addition and subtraction problems)	Measurement: Money (What is money?, coins up to 10p, coins up to £2 and totalling money up to 20p with coins and £20 with notes)	Measurement: Length, height, mass and volume (Beginning to work with measures and Working with practical measurement problems)		Number: Multiplication and Division (multiplication and division with concrete objects, multiplication and division using pictorial representations and using arrays)	
Year 2	Number: Place Value (Reading and writing numbers to 100 in words and numerals, Recognising place value: Tens and units, Using =, > and < symbols, Counting backwards and forwards in steps of 2, 3 and 5 from zero, Using representations for identifying and estimating numbers and Using place value and number facts) Number: Addition and Subtraction (Gaining fluency with addition and subtraction)	Number: Addition and Subtraction (Gaining fluency with addition and subtraction facts to 20 and deriving facts to 100, Adding and subtracting with concrete, pictorial and mental approaches, Knowing that addition is commutative but subtraction is not, Checking calculations and solving problems by understanding the relationship between addition and subtraction and Using concrete and pictorial approaches for solving a variety of	Measurement: Time (Knowing minutes in an hour and hours in a day, Telling the time to 5 minute accuracy and Beginning to use time intervals) Measurement: Length, height, mass and volume (Using standard units of measure and Comparing measures using =, > and < symbols)	Geometry: Shape (Naming, describing and sorting 2-D shapes based on number of sides, simple symmetry and Naming and describing 3-D shapes, Comparing and sorting common 2-D and 3-D shapes and Identifying faces of 3-D shapes as 2-D shapes) Number: Fractions (Recognising and writing 1/3, 1/4, 2/4 and 3/4 in a variety of situations and Recognising simple equivalent fractions)	Number: Fractions (Recognising and writing 1/3, 1/4, 2/4 and 3/4 in a variety of situations and Recognising simple equivalent fractions) Number: Multiplication and Division (Writing and solving multiplication and division calculations using appropriate symbols (up to 12 x 12), Using multiplication and division facts (2, 5, 10	Geometry: Position and direction (Accurately describing position, direction and movement and Recognising order in patterns and sequences) Probability and Statistics: Data (Reading tables, tally charts, bar charts and pictograms, Comparing with tables, tally charts, bar charts and pictograms and Interpreting and



	facts to 20 and deriving facts to 100, Adding and subtracting with concrete, pictorial and mental approaches, Knowing that addition is commutative but subtraction is not, Checking calculations and solving problems by understanding the relationship between addition and subtraction and Using concrete and pictorial approaches for solving a variety of addition and subtraction problems)	addition and subtraction problems) Measurement: Money (Beginning to use money symbols: £ and p, Solving simple money problems, including giving change and Forming monetary amounts with coins)			times tables), Knowing multiplication is commutative and division is not and Using multiple representations in multiplication and division problems)	creating pictograms, tally charts, block charts and tables)
Year 3	Number: Place Value (Reading and writing numbers to 1000, Identifying place value of digits (hundreds, tens, units only), Ordering numbers up to 1000, Using multiple representations for numbers and Solving problems with numbers up to 1000) Number: Addition and Subtraction (Mentally adding and subtracting 1, 10 and	Number: Addition and Subtraction (Mentally adding and subtracting 1, 10 and 100, Using column addition and subtraction (up to three digits), Solving simple missing number problems with addition and subtraction and Estimating and checking simple calculations)	Number: Multiplication and Division (Using times tables facts for 3, 4 and 8, Using times tables facts to calculate mentally and with written methods in simple cases (2-digit by 1-digit), Solving simple missing number problems with multiplication and division and Estimating	Number: Fractions (Counting in steps of 4, 8, 10, 50, and 100, Counting in tenths (fractions and decimals), Recognising unit and non-unit fractions, Adding and subtracting fractions within one whole (same denominator), Comparing fractions (same denominator), Recognising and writing unit and non-unit fractions, Recognising and representing equivalent fractions (small denominators) and Solving	Measurement: Time (Recalling seconds in a minute, days in each month and days in a year or leap year and Comparing durations of events) Geometry: Angles and Shapes (Knowing that angles can be thought of as properties of shapes and of a way of describing	Measurement: Length, mass and volume (Finding, comparing, adding and subtracting metric measures) Probability and Statistics: Data (Reading or showing simple data in tables, pictograms and bar charts and Solving problems involving simple data in tables,



	100, Using column addition and subtraction (up to three digits), Solving simple missing number problems with addition and subtraction and Estimating and checking simple calculations)	Number: Multiplication and Division (Using times tables facts for 3, 4 and 8, Using times tables facts to calculate mentally and with written methods in simple cases (2-digit by 1-digit), Solving simple missing number problems with multiplication and division and Estimating and checking simple calculations)	and checking simple calculations) Measurement: Money (calculating with money, one step real-life problems involving money, multi-step real-life problems involving money and money skills)	fraction problems with unit and non-unit fractions) Measurement: Time (Recalling seconds in a minute, days in each month and days in a year or leap year and Comparing durations of events)	turn, Understanding right-angles, Understanding the meaning of horizontal, vertical, perpendicular and parallel, Recognising, drawing and making 2-D and 3-D shapes and Beginning to measure perimeter)	pictograms and bar charts)
Year 4	Number: Place Value (Identifying place value of digits (thousands, hundreds, tens, units), Finding 1000 more or less, Comparing numbers beyond 1000, Counting backwards through zero, Understanding Roman numerals, Using numbers in different contexts and Solving positive number problems involving the four operations)	Number: Addition and Subtraction (Rounding to the nearest 10, 100 or 1000, Adding and subtracting using formal methods (up to 4 digits) and Solving two-step addition and subtraction problems) Number: Multiplication and Division	Number: Multiplication and Division (Using times tables facts up to 12 x 12, Multiplying and dividing mentally and Using factor pairs and commutativity in mental calculations) Measurement: Money	Number: Fractions (Counting in multiples of 6, 7, 9, 25 and 1000, Identifying and recognising hundredths, Adding and subtracting fractions (same denominator), Using diagrams to show equivalent fractions, Solving problems by using fractions to calculate or divide quantities, Recognising and writing decimal equivalents, Comparing numbers with the same number of	Measurement: Time (Converting between analogue and digital time and Solving time problems) Geometry: Angles, Lines and Shapes (Describing movements as translations, Comparing angles, Identifying lines of symmetry in 2-D shapes, Completing reflections, Classifying shapes based on	Measurement: Length, mass and volume (Converting between units of measure and Working with a variety of measures) Probability and Statistics: Data (Understanding graphs of discrete and continuous data and Solving problems with



	Number: Addition and Subtraction (Rounding to the nearest 10, 100 or 1000, Adding and subtracting using formal methods (up to 4 digits) and Solving two-step addition and subtraction problems)	(Using times tables facts up to 12×12, Multiplying and dividing mentally and Using factor pairs and commutativity in mental calculations)	(one and two step problems involving money)	decimal places (up to 2 d.p.) and Recognising and writing decimal equivalents of $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$) Measurement: Time (Converting between analogue and digital time and Solving time problems)	properties and size, Describing position using coordinates (1st quadrant only), Using coordinates to describe properties of polygons, Calculating the perimeter of rectilinear shapes and Finding the area by counting squares)	data given in tables, pictograms, bar charts and other graphs)
Year 5	Number: Place Value (Comparing numbers to at least one million, Rounding to the nearest 10, 100, 1000, 10000 or 100000, Counting forwards or backwards in steps of powers of 10, Interpreting negative numbers in context, Reading Roman numerals to 1000, number problems) Number: Addition and Subtraction (Adding and subtracting numbers mentally, Adding and subtracting using formal methods (more than 4 digits), Solving	Number: Multiplication and Division (Finding factor pairs, common factors and common multiples, Understanding prime factors and composite numbers, Determining whether a number is prime (up to 100), Recognising square and cube numbers, Multiplying and dividing mentally from known facts, Using long multiplication and other written methods, Using short division, Solving multiplication and division problems involving multiples, factors, squares	Number: Fractions (Comparing and ordering fractions (denominators multiples of same number), Using visual methods and number lines to identify equivalent fractions, Recognising and converting between mixed numbers and improper fractions, Adding and subtracting fractions (denominators multiples of same number), Multiplying proper fractions and mixed numbers by whole numbers, Recognising per cent (%) as parts per hundred and writing percentages as a decimal fractions and Solving	Geometry: Shapes and Angles (Understanding degrees as a measure of angle, Drawing and measuring angles, Identifying angles at a point, on a straight line or in a right angle, Working with the perimeter of composite rectilinear shapes, Using standard units to compare areas of rectangles and estimate areas of irregular shapes, Beginning to work with volume, Using the properties of rectangles, Distinguishing between regular and irregular polygons and Identifying 3-	SATS preparations (Practice papers, consolidation of skills, familiarising with exam conditions, practicing exam techniques, expanded problem solving and reasoning questioning)	Probability and statistics: Data (Solving problems with data given from line graphs, Working with information in tables (including timetables)) Measure: Time (Solving problems involving converting between units of time)



	multi-step addition and subtraction problems, Solving problems with numbers up to three decimal places)	and cubes and Solving multiplication and division problems involving fractions, scaling and rates)	problems using percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those with a denominator of a multiple of 10 or 25) Geometry: Shapes and Angles (Understanding degrees as a measure of angle, Drawing and measuring angles, Identifying angles at a point, on a straight line or in a right angle, Working with the perimeter of composite rectilinear shapes, Using standard units to compare areas of rectangles and estimate areas of irregular shapes, Beginning to work with volume, Using the properties of rectangles, Distinguishing between regular and irregular polygons and Identifying 3-D shapes from 2-D representations)	D shapes from 2-D representations) Measure: Position and direction (Finding the position of a shape following a reflection or translation)		
Year 6	Number: Place Value (Comparing numbers up to ten million, Multiplying and	Number: Multiplication and Division	Number: Fractions (Comparing and ordering fractions, Using common	Geometry: Shapes and Angles	SATS preparations (Practice papers, consolidation of skills,	Probability and statistics: Data



	dividing decimals by 10, 100 and 1000 (up to 3 d.p.), Rounding numbers to an appropriate degree of accuracy, Using negative numbers in context) Number: Addition and Subtraction (Solving multi-step addition and subtraction problems in context, Solving number problems and puzzles)	(Performing mental calculations with mixed operations, Using long multiplication, Using formal written method for short division, Using formal written method for long division, Using written division methods including solutions up to 2 d.p., Understanding order of operations (aka BIDMAS, BODMAS or PEDMAS), Solving problems with the four operators, Multiplying whole numbers by decimals (up to 2 d.p.), Solving number problems and puzzles)	factors and common multiples to find equivalent fractions, Adding and subtracting fractions (different denominators and mixed numbers) using equivalent fractions, Working with equivalences between simple fractions, decimals and percentages, Calculating decimal fraction equivalents for a simple fraction by considering fractions as divisions, Multiplying simple pairs of proper fractions, giving answers in simplest form, Dividing proper fractions by whole numbers) Geometry: Shapes and Angles (Knowing that shapes can have the same area, but different perimeter or the same perimeter but different area, Knowing when to use a formula to find area or volume, Finding area of triangles and parallelograms, Working with volume of cubes and cuboids,	(Knowing that shapes can have the same area, but different perimeter or the same perimeter but different area, Knowing when to use a formula to find area or volume, Finding area of triangles and parallelograms, Working with volume of cubes and cuboids, Drawing 2-D shapes, Working with angles at a point, on a straight line or vertically opposite, Working with properties of polygons, Knowing correct terminology for circles parts, Representing and building 3-D shapes) Measure: Position and direction (Using coordinates to describe position, Translating and reflecting shapes on a coordinate plane)	familiarising with exam conditions, practicing exam techniques, expanded problem solving and reasoning questioning)	(Solving problems involving pie charts and line graphs, Understanding and Working with the Mean) Algebra (Finding possible combinations of two variables, Finding number pairs to satisfy equations in two unknowns, Expressing missing numbers algebraically)
--	---	---	--	---	--	--



			Drawing 2-D shapes, Working with angles at a point, on a straight line or vertically opposite, Working with properties of polygons, Knowing correct terminology for circles parts, Representing and building 3-D shapes)			
--	--	--	---	--	--	--



Year 1/2 mix Number and place value

Year 1 objectives

Year 2 objectives

1	Counting forwards and backwards up to 10 and Counting forwards and backwards from 10-20 Numbers to 100
2	Counting forward and backwards beyond 20 Numbers to 100
3	To Count Backwards and Forwards from any Given Number to Another Given Numbers 0-100 and Beyond. Reading and writing numbers to 100
4	To be able to read numbers to 20 Making numbers
5	To be able to write numbers to 20 What is the value?
6	Finding one More than a Given Number Partition sums



7	Finding One Less Than a Given Number Numbers between
8	Finding one more and one less Ordering Numbers
9	Identify and Represent Numbers Using Objects and Pictorial Representations Comparing numbers with words
10	Identify and Represent Numbers Using Objects and Pictorial Representations Comparing numbers with symbols
11	Using Pictorial Representations to Recognise and Identify More Than or Less Than a Number or Amount Ordering and comparing numbers
12	Using Pictorial Representations to Recognise and Identify More Than or Less Than a Number or Amount Identify, represent and estimate numbers using different representations
13	Using Pictorial Representations to Recognise and Identify More Than or Less Than a Number or Amount Use place value to solve problems
14	To Develop Identifying and Representing Numbers Using Objects and Pictorial Representations Using Most, Least, More Than, Less Than, Equal To to Compare Numbers.



	Use place value and number facts to solve problems
15	To Develop Identifying and Representing Numbers Using Objects and Pictorial Representations Using Most, Least, More Than, Less Than, Equal To to Compare Numbers. Use place value and number facts to solve real life problems
16	Counting in steps of 10 Counting in steps of 10 from any given number
17	To count in steps of 2 forwards To count in steps of 2 forwards and backwards
18	Counting in steps of 5 forward Counting in steps of 5 forward and backwards
19	Count, Read and Write in Steps of 2, 5 & 10 Counting in steps of 3
20	Count, Read and Write in Steps of 2, 5 & 10 Counting in steps of 2, 3 and 5 from 0 and in 10's from any number forward and backward