

**EVERY  
CHILD**

Belonging  
Nurture  
Safety



**EVERY  
CHANCE**

Opportunities  
Inclusive  
Adapt

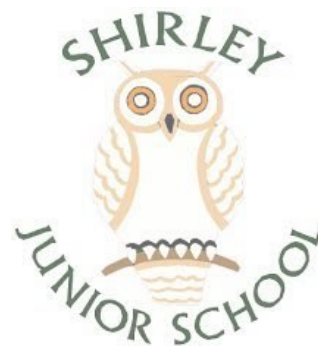


**EVERY  
DAY**

Understanding  
Consistent  
Ambitious



# Maths at Shirley Junior School



**KINDNESS.  
RESPECT.  
INTEGRITY.**

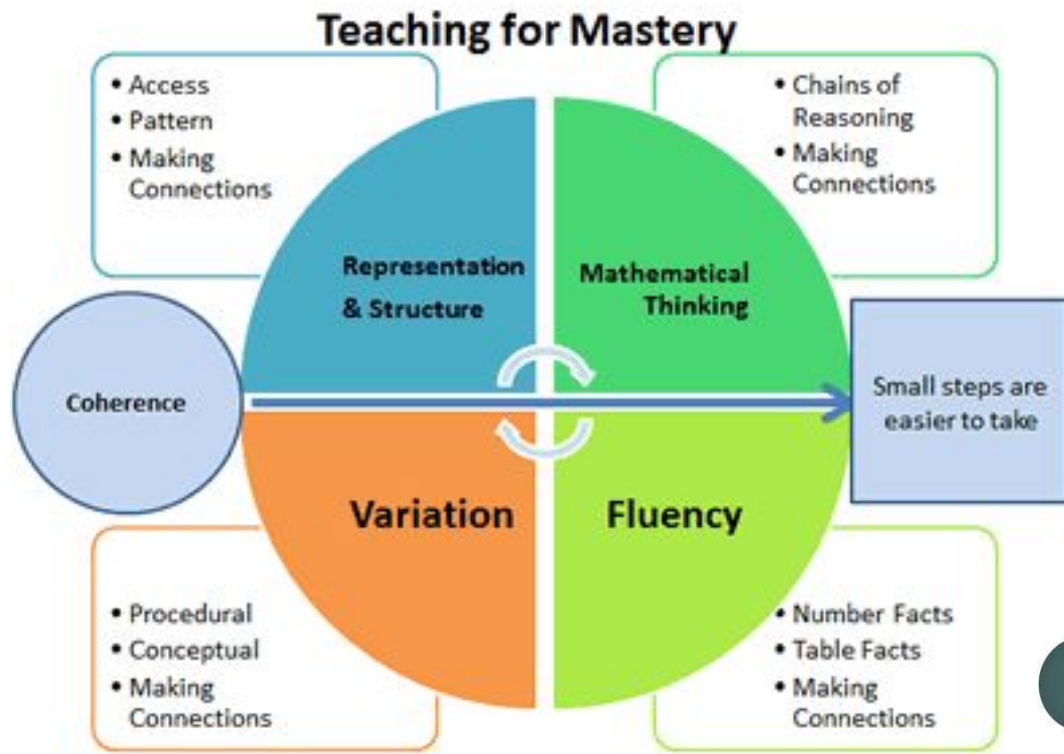
# VISION

At Shirley Junior School, we believe **all children** should have a deep understanding of all mathematical concepts. Number is at the heart of our curriculum and *daily practice* takes place in every year group to ensure fluency of number and facts to aid them with competence and confidence in mastery.

Our mathematics curriculum fosters positive attitudes, fascination and excitement of discovery through teaching and learning. Alongside this, through quality teaching and our careful consideration of tasks, we aim to embellish a positive and resilient attitude towards maths and for children to have the ability to solve problems, reason, think logically and to work systematically and accurately. Furthermore, to enable the children to confidently reason about mathematics, we ensure children are exposed to a range of mathematical language, recognising its importance for deep thinking and understanding.

Children at Shirley Junior School will understand that mathematics is integral to all aspects of life, and with this in mind, we endeavour to make rich and varied real life connections in our lessons to ensure that children become confident mathematicians. Finally, we believe that all children should have a range of strategies, working both collaboratively and independently, so that we create lifelong independent learners who take responsibility for their own learning.

# How we are Mathematicians...



# Key Mathematical Concepts

- Number and Place Value
- Number Facts
- Addition and Subtraction
- Multiplication and Division
- Fractions
- Geometry



NCETM  
NATIONAL CENTRE FOR EXCELLENCE  
IN THE TEACHING OF MATHEMATICS

# Maths knowledge progression

	3	4	5	6
Number and Place Value	<p>Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10.</p> <p>Recognise the place value of each digit in three-digit numbers, and compose and decompose three-digit numbers using standard and non-standard partitioning.</p> <p>Reason about the location of any three-digit number in the linear number system, including identifying the previous and next multiple of 100 and 10.</p> <p>Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts.</p>	<p>Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100.</p> <p>Recognise the place value of each digit in four-digit numbers, and compose and decompose four-digit numbers using standard and non-standard partitioning.</p> <p>Reason about the location of any four-digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100, and rounding to the nearest of each.</p> <p>Divide 1,000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1,000 with 2, 4, 5 and 10 equal parts.</p>	<p>Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01.</p> <p>Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01.</p> <p>Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and non-standard partitioning.</p> <p>Reason about the location of any number with up to 2 decimals places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each.</p> <p>Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts.</p> <p>Convert between units of measure, including using common decimals and fractions.</p>	<p>Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).</p> <p>Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning.</p> <p>Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.</p> <p>Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.</p> <p>Composition and calculation: numbers up to 10,000,000</p>

	3	4	5	6
Number Facts	<p>Secure fluency in addition and subtraction facts that bridge 10, through continued practice.</p> <p>Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.</p> <p>Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10).</p>	<p>Recall multiplication and division facts up to <math>12 \times 12</math>, and recognise products in multiplication tables as multiples of the corresponding number.</p> <p>Recall multiplication and division facts up to <math>12 \times 12</math>, and recognise products in multiplication tables as multiples of the corresponding number.</p> <p>Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders.</p> <p>Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100)</p>	<p>Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth).</p>	

	3	4	5	6
Addition and Subtraction	<p>Add and subtract across 10</p> <p>Calculate complements to 100.</p> <p>Add and subtract up to three-digit numbers using columnar methods.</p> <p>Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part-part-whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction.</p>	<p>Add and subtract up to three-digit numbers using columnar methods.</p>		<p>Understand that 2 numbers can be related additively, quantify additive relationships</p> <p>Use a given additive calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.</p> <p>Common structures and the part-part-whole relationship</p> <p>Using equivalence and the compensation property to calculate</p> <p>Solve problems involving ratio relationships.</p> <p>Scale factors, ratio and proportional reasoning</p> <p>Solve problems with 2 unknowns.</p>



	3	4	5	6
Multiplication and Division	<p>Apply known multiplication and division facts to solve contextual problems with different structures, including <u>quotitive</u> and partitive division.</p>	<p>Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size</p> <p>Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication.</p> <p>Understand and apply the distributive property of multiplication.</p>	<p>Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size.</p> <p>Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.</p> <p>Multiply any whole number with up to 4 digits by any one-digit number using a formal written method.</p> <p>Divide a number with up to 4 digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context.</p>	<p>Understand that 2 numbers can be related multiplicatively, and quantify multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).</p> <p>Use a given multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.</p> <p>Common structures and the part-part-whole relationship</p> <p>Using equivalence and the compensation property to calculate</p> <p>Multiplication strategies for larger numbers and long multiplication</p> <p>Division: dividing by two-digit divisors</p> <p>Solve problems involving ratio relationships.</p> <p>Scale factors, ratio and proportional reasoning</p> <p>Solve problems with 2 unknowns.</p>



	3	4	5	6
Fractions	<p>Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts.</p> <p>Find unit fractions of quantities using known division facts (multiplication tables fluency).</p> <p>Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts.</p> <p>Reason about the location of any fraction within 1 in the linear number system.</p> <p>Add and subtract fractions with the same denominator, within 1.</p>	<p>Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts.</p> <p>Reason about the location of mixed numbers in the linear number system.</p> <p>Convert mixed numbers to improper fractions and vice versa.</p> <p>Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers.</p>	<p>Find non-unit fractions of quantities.</p> <p>Find equivalent fractions and understand that they have the same value and the same position in the linear number system.</p> <p>Recall decimal fraction equivalents for <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{5}</math> and <math>\frac{1}{10}</math>, and for multiples of these proper fractions.</p>	<p>Recognise when fractions can be simplified, and use common factors to simplify fractions.</p> <p>Express fractions in a common denomination and use this to compare fractions that are similar in value.</p> <p>Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy.</p> <p>Common denomination: more adding and subtracting</p> <p>Multiplying fractions and dividing fractions by a whole number</p> <p>Linking fractions, decimals and percentages</p>

	3	4	5	6
Geometry	<p>Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations.</p> <p>Draw polygons by joining marked points, and identify parallel and perpendicular sides.</p>	<p>Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant.</p> <p>Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal. Find the perimeter of regular and irregular polygons.</p> <p>Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry.</p>	<p>Compare angles, estimate and measure angles in degrees (<math>^{\circ}</math>) and draw angles of a given size.</p> <p>Compare areas and calculate the area of rectangles (including squares) using standard units.</p>	<p>Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.</p>

	3	4	5	6
Other	Time	Time		<p>Composition and calculation: multiples of 1,000 up to 1,000,000</p> <p>Multiplicative contexts: area and perimeter 2</p> <p>Statistics</p> <p>Combining multiplication with addition and subtraction</p> <p>Combining division with addition and subtraction</p> <p>Mean average and equal shares</p>

# Year 3 Overview

	Unit	Unit name
Autumn 1	1	Adding and subtracting across 10
	2	Numbers to 1,000
Autumn 2		
Spring 1	3	Right angles
	4	Manipulating the additive relationship and securing mental calculation
Spring 2	5	Column addition
	6	2, 4, 8 times tables
	7	Column subtraction
Summer 1	8	Unit fractions
Summer 2	9	Non-unit fractions
	10	Parallel and perpendicular sides in polygons
	11	Time

# Year 4 Overview

	Unit	Unit name
Autumn 1	1	Review of column addition and subtraction
	2	Numbers to 10,000
	3	Perimeter
Autumn 2	4	3, 6, 9 times tables
	5	7 times table and patterns
Spring 1	6	Understanding and manipulating multiplicative relationships
	7	Coordinates
Summer 1	8	Review of fractions
	9	Fractions greater than 1
Summer 2	10	Symmetry in 2D shapes
	11	Time
	12	Division with remainders

# Year 5 Overview

	Unit	Unit name
Autumn 1		
	1	Decimal fractions
	2	Money
Autumn 2	3	Negative numbers
	4	Short multiplication and short division
Spring 1	5	Area and scaling
Spring 2	6	Calculating with decimal fractions
	7	Factors, multiples and primes
Summer 1	8	Fractions
Summer 2	9	Converting units
	10	Angles

# Year 6 Overview

	Unit	Unit name
Autumn 1	1	Calculating using knowledge of structures (1)
	2	Multiples of 1,000
Autumn 2	3	Numbers up to 10,000,000
	4	Draw, compose and decompose shapes
Spring 1	5	Multiplication and division
	6	Area, perimeter, position and direction
Spring 2	7	Fractions and percentages
	8	Statistics
Summer 1		KS2 tests
Summer 2	9	Ratio and proportion
	10	Calculating using knowledge of structures (2)
	11	Solving problems with two unknowns
	12	Order of operations
	13	Mean average