



Our Global Explorer Curriculum St Nicholas' Primary Maths Progression Grid

Maths Curriculum Intent:

As a school we aim to ensure that all children leave us prepared for the world as 'Global Explorers' equipped to pursue any career they choose. Being 'aspirational' is one of our core strands to our curriculum. It is important that all children leave us with a good foundation in Mathematics so that they can aspire to be anything that they want to. We want every child to be successful and encourage children to develop an "I can do Maths" attitude. The success of our curriculum is seen in our children's ability to discuss and reason mathematically and apply their knowledge and skills to problem solving and investigative tasks.

By the end of Foundation Stage it is our intent that all children are able to recognise, order and manipulate numbers to 10.

By the end of KS1 it is our intent that all children are able to add and subtract 2-digit numbers using an efficient strategy; and to multiply and divide numbers linked to 2, 5 and 10.

By the end of KS2 it is our intent that all children are able to select and use an efficient method of calculation for all operations; to show calculation fluency and to understand the connections between the four operations.

National Curriculum

EYFS

Count objects, actions and sounds.
Subitise.
Link the number symbol (numeral) with its cardinal number value.
Compare numbers.
Understand the 'one more than/one less than' relationship between numbers.
Explore the composition of numbers to 10.
Select, rotate and manipulate shapes in order to develop spatial reasoning skills.
Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.
Continue, copy and create repeating patterns.
Compare length, weight and capacity.

KS1 and KS2

The National Curriculum for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

Key Concepts

Number	Addition and Subtraction	Multiplication and Division	Fractions, Decimals and Percentages	Ratio and Proportion	Measurement	Geometry	Statistics
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NUMBER	Milestone 1 (end Y2)	Milestone 2 (end Y4)	Milestone (end Y6)
Counting	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward	count backwards through zero to include negative numbers count in multiples of 6, 7, 9, 25 and 1000 find 1000 more or less than a given number	use negative numbers in context, and calculate intervals across zero
Comparing	compare and order numbers from 0 up to 100; use <, > and = signs	order and compare numbers beyond 1000	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
Identifying, representing and estimating	identify, represent and estimate numbers using different representations, including the number line	identify, represent and estimate numbers using different representations	
Reading and writing, including Roman numerals	read and write numbers to at least 100 in numerals and in words	read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
Understanding place value	recognise the place value of each digit in a two-digit number (tens, ones)	recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
Rounding		round any number to the nearest 10, 100 or 1000	round any whole number to a required degree of accuracy
Problem solving	use place value and number facts to solve problems	solve number and practical problems that involve all of the above and with increasingly large positive numbers	solve number and practical problems that involve all of the above

ADDITION AND SUBTRACTION	Milestone 1 (end Y2)	Milestone 2 (end Y4)	Milestone (end Y6)
Add and subtract	<p>recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</p> <p>add and subtract numbers using concrete objects, pictorial representations, and mentally, including:</p> <ul style="list-style-type: none"> * a two-digit number and ones * a two-digit number and tens * two two-digit numbers <p>adding three one-digit numbers</p> <p>show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot</p>	<p>add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate</p>	<p>perform mental calculations, including with mixed operations and large numbers</p> <p>use their knowledge of the order of operations to carry out calculations involving the four operations</p>
Inverse and estimating	<p>recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.</p>	<p>estimate and use inverse operations to check answers to a calculation (up to 4-digits)</p>	<p>use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.</p>
Problem solving	<p>solve problems with addition and subtraction:</p> <ul style="list-style-type: none"> * using concrete objects and pictorial representations, including those involving numbers, quantities and measures <p>applying their increasing knowledge of mental and written methods</p>	<p>solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why</p>	<p>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</p>

MULTIPLICATION AND DIVISION	Milestone 1 (end Y2)	Milestone 2 (end Y4)	Milestone (end Y6)
Number facts	recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	recall multiplication and division facts for multiplication tables up to 12×12 recognise and use factor pairs and commutativity in mental calculations	identify common factors, common multiples and prime numbers use their knowledge of the order of operations to carry out calculations involving the four operations
Mental methods	show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot	use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers recognise and use factor pairs and commutativity in mental calculations	perform mental calculations, including with mixed operations and large numbers
Written methods	calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs	multiply two-digit and three-digit numbers by a one-digit number using formal written layout	multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
Problem solving	solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	solve problems involving addition, subtraction, multiplication and division use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy

FRACTIONS, DECIMALS AND PERCENTAGES	Milestone 1 (end Y2)	Milestone 2 (end Y4)	Milestone (end Y6)
Recognising	recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity	recognise and show, using diagrams, families of common equivalent fractions	use common factors to simplify fractions; use common multiples to express fractions in the same denomination
Understanding place value		recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten	compare and order fractions, including fractions >1
Applying the 4 operations		<p>solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number</p> <p>add and subtract fractions with the same denominator</p>	<p>add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions</p> <p>multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$)</p> <p>divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$)</p>
Decimals: understanding place value		<p>recognise and write decimal equivalents of any number of tenths or hundredths</p> <p>recognise and write decimal equivalents to $\frac{1}{4}$; $\frac{1}{2}$; $\frac{3}{4}$</p> <p>find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths</p>	<p>associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)</p> <p>identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places</p>

Rounding, comparing and calculating decimals		<p>round decimals with one decimal place to the nearest whole number</p> <p>compare numbers with the same number of decimal places up to two decimal places</p>	<p>multiply one-digit numbers with up to two decimal places by whole numbers</p> <p>use written division methods in cases where the answer has up to two decimal places</p>
Problem solving		<p>solve simple measure and money problems involving fractions and decimals to two decimal places.</p>	<p>solve problems which require answers to be rounded to specified degrees of accuracy</p> <p>recall and use equivalences between simple fractions, decimals and percentages, including in different contexts</p>
RATIO AND PROPORTION	Milestone 1 (end Y2)	Milestone 2 (end Y4)	Milestone (end Y6)
Integer multiplication and division facts			<p>solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts</p>
Percentages			<p>solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison</p>
Scale factor			<p>solve problems involving similar shapes where the scale factor is known or can be found</p>
Fractions			<p>solve problems involving unequal sharing and grouping using knowledge of fractions and multiples</p>
ALGEBRA			<p>generate and describe linear number sequences</p> <p>express missing number problems algebraically</p> <p>find pairs of numbers that satisfy number sentences involving two unknowns</p> <p>enumerate all possibilities of combinations of two variables</p>

MEASUREMENT	Milestone 1 (end Y2)	Milestone 2 (end Y4)	Milestone (end Y6)
Identifying different measures	choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels	Convert between different units of measurement (e.g. kilometre to metre; hour to minute).	use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places
Estimate and use different measures	compare and order lengths, mass, volume/capacity and record the results using >, < and =	estimate, compare and calculate different measures	solve problems involving the calculation and conversion of units of measure , using decimal notation up to three decimal places where appropriate
Money	recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value find different combinations of coins that equal the same amounts of money solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change	estimate, compare and calculate money in pounds and pence	
Time	compare and sequence intervals of time tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times. know the number of minutes in an hour and the number of hours in a day.	read, write and convert time between analogue and digital 12 and 24-hour clocks solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days	
Perimeter, area and volume			recognise when it is possible to use formulae for area and volume of shapes

			<p>calculate the area of parallelograms and triangles</p> <p>calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [e.g. mm^3 and km^3].</p>
GEOMETRY	Milestone 1 (end Y2)	Milestone 2 (end Y4)	Milestone (end Y6)
Shape	<p>identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line</p> <p>identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces</p> <p>identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]</p> <p>compare and sort common 2-D and 3-D shapes and everyday objects</p>	<p>compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes</p>	<p>draw 2-D shapes using given dimensions and angles</p> <p>recognise, describe and build simple 3-D shapes, including making nets</p>
Angles		<p>Identify acute and obtuse angles and compare and order angles up to two right angles by size</p>	<p>compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons</p> <p>recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles</p> <p>illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius</p>
Symmetry		<p>identify lines of symmetry in 2-D shapes presented in different orientations</p>	

		complete a simple symmetric figure with respect to a specific line of symmetry	
Position and direction	<p>order and arrange combinations of mathematical objects in patterns and sequences</p> <p>use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)</p>	<p>describe positions on a 2-D grid as coordinates in the first quadrant</p> <p>describe movements between positions as translations of a given unit to the left/right and up/down</p> <p>plot specified points and draw sides to complete a given polygon</p>	<p>describe positions on the full coordinate grid (all four quadrants)</p> <p>draw and translate simple shapes on the coordinate plane, and reflect them in the axes.</p>
STATISTICS	Milestone 1 (end Y2)	Milestone 2 (end Y4)	Milestone (end Y6)
Interpret and construct	interpret and construct simple pictograms, tally charts, block diagrams and simple tables	interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	<p>interpret and construct pie charts and line graphs and use these to solve problems</p> <p>calculate and interpret the mean as an average</p>
Problem solving	<p>ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity</p> <p>ask and answer questions about totalling and comparing categorical data</p>	solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	use pie charts and line graphs to solve problems