

St Mary’s R.C. Primary



**Mathematics Progression Map and End Points**

**St. Mary’s RC Primary**

**Mathematics Curriculum Progression and End Points**

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|  |  **End of EYFS** |  **End of KS 1** |  **End of Lower KS 2** |  **End of Upper KS 2** |
| **Place Value** | * counts in steps of 1 from 0 to 20 forwards and backwards and then beyond
* counting in 1’s forwards and backwards from any number up to 20 and then beyond recognising the pattern of the counting system.
* Link the number symbol (numeral) with its cardinal number value.
* Explore the composition of numbers to 10.
* Automatically recall number bonds for numbers 0–5 and some to 10.
* Have a deep understanding of number to 10, including the composition of each number.
* Subitise (recognise quantities without counting) up to 5.
* Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.
 | * count in steps of 2, 3, and 5 from 0, and in tens

from any number, forward and backward * recognise the place value of each digit in a

two-digit number (tens, ones) identify, represent and estimate numbers using different representations, including the number line * compare and order numbers from 0 up to 100; use and = signs
* read and write numbers to at least 100 in

numerals and in words * use place value and number facts to solve

problems | * count in multiples of 6, 7, 9, 25 and 1000
* find 1000 more or less than a given number
* count backwards through zero to include negative numbers
* recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)
* order and compare numbers beyond 1000
* identify, represent and estimate numbers using different representations
* round any number to the nearest 10, 100 or 1000
* solve number and practical problems that involve all of the above and with increasingly large positive numbers
* read Roman numerals to 100 (I to C) and understand how, 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
* round any whole number to a required degree of accuracy
* use negative numbers in context, and calculate intervals across zero
* solve number problems and practical problems that involve all of the above.
 |
| **Addition &** **Subtraction** | * compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
 | * solve problems with addition and subtraction:
* using concrete objects and pictorial

representations, including those involving numbers, quantities and measures * applying their increasing knowledge of mental and

 written methods * recall and use addition and subtraction facts to 20

fluently, and derive and use related facts up to 100 * add and subtract numbers using concrete objects,

pictorial representations, and mentally, including: * a two-digit number and ones
* a two-digit number and tens
* two two-digit numbers
* adding three one-digit numbers
* show that addition of two numbers can be done in
* any order (commutative) and subtraction of one
* number from another cannot
* recognise and use the inverse relationship between

addition and subtraction and use this to check calculations and solve missing number problems. | * add and subtract numbers with up to 4 digits using the efficient written methods of columnar addition and subtraction where appropriate
* estimate and use inverse operations to check answers to a calculation
* solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why
 | * multiply multi-digit numbers up to 4 digits by a two-digit whole number using the efficient written method of long multiplication
* 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
* divide numbers up to 4 digits by a two-digit whole number using the formal written method of short division, and interpreting remainders according to the context
* perform mental calculations, including with mixed operations and large numbers
* identify common factors, common multiples and prime numbers
* use their knowledge of the order of operations to carry out calculations involving the four operations
* solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
* 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.
 |
| **Multiplication & Division** | * explore and represent patterns

within numbers up to 10, including evens and odds, double facts and how quantities can be distributed * equally
 | * recall and use multiplication and division facts for

the 2, 5 and 10 multiplication tables, including recognising odd and even numbers * calculate mathematical statements for multiplication and

division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs * show that multiplication of two numbers can be
* done in any order (commutative) and division of

one number by another cannot * solve problems involving multiplication and division, using

materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts. | * recall multiplication and division facts for multiplication tables up to 12 × 12
* 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
* multiply and divide two-digit and three-digit numbers by a one-digit number using formal written layout
* 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
 |
| **Fractions** **(including decimals** **and percentages)** | * in practical activities explore

halves of whole amounts | * recognise, find, name and write fractions 1/3, ¼,

2/4 and ¾ of a length, shape, set of objects or quantity * write simple fractions for example, ½ of 6 = 3 and recognise

 the equivalence of 2/4 and ½ . | * recognise and show, using diagrams, families of common equivalent fractions
* count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten
* 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
* add and subtract fractions with the same denominator
* recognise and write decimal equivalents of any number of tenths or hundredths
* recognise and write decimal equivalents to ¼; ½; ¾
* 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 units, tenths and hundredths
* round decimals with one decimal place to the nearest whole number
* compare numbers with the same number of decimal places up to two decimal places
* solve simple measure and money problems involving fractions and decimals to two decimal places.
 | * use common factors to simplify fractions; use common multiples to express fractions in the same denomination
* compare and order fractions, including fractions >1
* associate a fraction with division to calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8)
* add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
* multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. 1/4 × 1/2 = 1/8)
* divide proper fractions by whole numbers (e.g. 1/3 ÷ 2 = 1/6).
* 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
* multiply one-digit numbers with up to two decimal places by whole numbers
* use written division methods in cases where the answer has up to two decimal places
* solve problems which require answers to be rounded to specified degrees of accuracy.
* recall and use equivalences between simple fractions, decimals and percentages, including in different contexts and to compare proportions
 |
| **Measurement** | * compare length, weight

 and capacity.  | * 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 * compare and order lengths, mass, volume/capacity and record the

results using >, < and = * 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* 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. | * convert between different units of measure (e.g. kilometre to metre; hour to minute)
* measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres
* find the area of rectilinear shapes by counting squares
* estimate, compare and calculate different measures, including money in pounds and pence
* 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.
 | * solve problems involving the calculation and conversion of units of measure, using decimal notation to three decimal places where appropriate
* 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 three decimal places
* convert between miles and kilometres
* recognise that shapes with the same areas can have different perimeters and vice versa
* calculate the area of parallelograms and triangles
* recognise when it is necessary to use the formulae for area and volume of shapes
* calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm3) and cubic metres (m3) and extending to other units, such as mm3 and km3.
 |
| **Geometry****(Properties of Shapes)** | * Select, rotate and manipulate shapes in order to develop spatial reasoning skills.
* Selects a particular named shape.
* Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.
 | * identify and describe the properties of 2-D shapes,

including the number of sides and line symmetry in a vertical line * identify and describe the properties of 3-D shapes,

 including the number of edges, vertices and faces * identify 2-D shapes on the surface of 3-D shapes,

 [for example, a circle on a cylinder and a triangle on a pyramid] * compare and sort common 2-D and 3-D shapes and everyday

 objects | * compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes
* identify acute and obtuse angles and compare and order angles up to two right angles by size
* identify lines of symmetry in 2-D shapes presented in different orientations
* complete a simple symmetric figure with respect to a specific line of symmetry.
 | * Draw 2D shapes using given dimensions and angles
* recognise, describe and build simple 3-D shapes, including making nets
* compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
* illustrate and name parts of circles, including radius, diameter and circumference
* recognise angles where they meet at a point, are on a straight line, and are vertically opposite and find missing angles
 |
| **Geometry****(Position & Direction)** | * continue, copy and creates

 repeating patterns.* uses everyday language to

talk about position and distance. | * order and arrange combinations of mathematical

objects in patterns and sequences * use mathematical vocabulary to describe position,

direction and movement, including movement in a straight line and distinguishing between rotation asa turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise). | * describe positions on a 2-D grid as coordinates in the first quadrant
* describe movements between positions as translations of a given unit to the left/right and up/down
* plot specified points and draw sides to complete a given polygon.
 | * describe positions on the full coordinate grid (all four quadrants)
* draw and translate simple shapes on the coordinate plane, and reflect them in the axes.
 |
| **Statistics** |  | * interpret and construct simple pictograms, tally

charts, block diagrams and simple tables * ask and answer simple questions by counting the

number of objects in each category and sorting the categories by quantity * ask and answer questions about totalling and
* comparing categorical data.
 | * interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs
* solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.
 | * interpret and construct pie charts and line graphs and use these to solve problems
* calculate and interpret the mean as an average
 |
| **Ratio &** **Proportion** |  |  | * recognise the per cent symbol (%) and understand that per cent relates to ‘number of parts per hundred’, and write percentages as a fraction with denominator 100, and as a decimal
* solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$ , $\frac{1}{4}$, $\frac{1}{5}$ , $\frac{2}{5}$, $\frac{4}{5} $and those fractions with a denominator of a multiple of 10 or 25.
 | * solve problems involving the relative sizes of two quantities, where missing values can be found by using integer multiplication and division facts
* solve problems involving the calculation of percentages e.g. of measures and such as 15% of 360 and the use of percentages for comparison
* solve problems involving similar shapes where the scale factor if known or can be found
* solve problems involving unequal sharing and grouping using knowledge and multiples
 |
| **Algebra** | * explore and represent patterns

 within numbers up to 10 | * solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = – 9.
* recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.
 | * solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.
 | * express missing number problems algebraically
* use simple formulae expressed in words
* generate and describe linear number sequences
* find pairs of numbers that satisfy number sentences involving two unknowns.
* Enumerate all possibilities of combinations of two variables
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