St Mary Magdalen's RCVA Primary School

Mathematics Curriculum Statement

NATIONAL CURRICULUM PURPOSE OF STUDY

THE NATIONAL CURRICULUM STATES THAT:

Mathematics education 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.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The National Curriculum for mathematics reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and enabling them in presenting a mathematical justification, argument or proof. Teachers should ensure that pupils build secure foundations by assisting them in making their thinking clear to themselves and to others.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

NATIONAL CURRICULUM REQUIREMENTS FOR SUBJECT CONTENT AT KS1

The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects and

measuring tools].

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.

Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Year 1 programme of study

Pupils should be taught to:
*   count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
*   count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens
*   given a number, identify one more and one less
*   identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least
*   read and write numbers from 1 to 20 in numerals and words.
*   read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs
*   represent and use number bonds and related subtraction facts within 20
*   add and subtract one-digit and two-digit numbers to 20, including zero
*   solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = * − 9
*   solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.
*   recognise, find and name a half as one of two equal parts of an object, shape or quantity
*   recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.
*   compare, describe and solve practical problems for:
*   lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]
*   mass/weight [for example, heavy/light, heavier than, lighter than]
*   capacity and volume [for example, full/empty, more than, less than, half, half full, quarter]
*   time [for example, quicker, slower, earlier, later]
*   measure and begin to record the following:
*   lengths and heights
*   mass/weight
*   capacity and volume
*   time (hours, minutes, seconds)

- recognise and know the value of different denominations of coins and notes
- sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]
- recognise and use language relating to dates, including days of the week, weeks, months and years
- tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.
- recognise and name common 2-D and 3-D shapes, including:
- 2-D shapes [for example, rectangles (including squares), circles and triangles]
- 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]
- describe position, direction and movement, including whole, half, quarter and three-quarter turns.

Year 2 programme of study

- Pupils should be taught to:
- 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.
- 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) a two-digit number and ones
  - b) a two-digit number and tens
  - c) two two-digit numbers
  - d) 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.
- 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 ($\div$) 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

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addition, mental methods, and multiplication and division facts, including problems in contexts.

- 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 1/2
- 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.
- 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.
- 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 as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).
- 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 totaling and comparing categorical data.
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NATIONAL CURRICULUM REQUIREMENTS FOR SUBJECT CONTENT AT KS2

Lower key stage 2

- The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.
- At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.
- By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.
- Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

Year 3 programme of study

- Pupils should be taught to:
- count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number
- recognise the place value of each digit in a three-digit number (hundreds, tens, ones)
- compare and order numbers up to 1000
- identify, represent and estimate numbers using different representations
- read and write numbers up to 1000 in numerals and in words
- solve number problems and practical problems involving these ideas.
- add and subtract numbers mentally, including:
  - a)a three-digit number and ones
  - b)a three-digit number and tens
  - c)a three-digit number and hundreds
- add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction
- estimate the answer to a calculation and use inverse operations to check answers
- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.
- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.
- count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10
- recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators

- recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators
- recognise and show, using diagrams, equivalent fractions with small denominators
- add and subtract fractions with the same denominator within one whole [for example, 5/7 + 1/7 = 6/7
- compare and order unit fractions, and fractions with the same denominators
- solve problems that involve all of the above.
- measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)
- measure the perimeter of simple 2-D shapes
- add and subtract amounts of money to give change, using both £ and p in practical contexts
- tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks
- estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight
- know the number of seconds in a minute and the number of days in each month, year and leap year
- compare durations of events [for example to calculate the time taken by particular events or tasks].
- draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them
- recognise angles as a property of shape or a description of a turn
- identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle
- identify horizontal and vertical lines and pairs of perpendicular and parallel lines.
- interpret and present data using bar charts, pictograms and tables
- solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.

Year 4 programme of study

Pupils should be taught to
- 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 know that over time, the numeral system changed to include the concept of zero and place value.
- add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
- estimate and use inverse operations to check answers to a calculation

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- solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.
- recall multiplication and division facts for multiplication tables up to 12 x 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 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.
- 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 one 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 ones, 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.
- Convert between different units of measure [for example, 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.
- 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.
- 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.
- 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.

Upper Key Stage 2

- The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.
- At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.
- By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.
- Pupils should read, spell and pronounce mathematical vocabulary correctly.

Year 5 programme of study

Pupils should be taught to:

- read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit
- count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000
- interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero
- round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
- solve number problems and practical problems that involve all of the above
- read Roman numerals to 1000 (M) and recognise years written in Roman numerals
- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- add and subtract numbers mentally with increasingly large numbers
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers
- establish whether a number up to 100 is prime and recall prime numbers up to 19
- multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- multiply and divide numbers mentally drawing upon known facts
- divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)

- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.
- compare and order fractions whose denominators are all multiples of the same number
- identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
- recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, 5 2 + 5 4 = 5 6 = 1 5 1]
- add and subtract fractions with the same denominator and denominators that are multiples of the same number
- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
- read and write decimal numbers as fractions [for example, 0.71 = 100 71]
- recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- round decimals with two decimal places to the nearest whole number and to one decimal place
- read, write, order and compare numbers with up to three decimal places
- solve problems involving number up to three decimal places
- 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 2 1 , 4 1 , 5 1 , 5 2 , 5 4 and those fractions with a denominator of a multiple of 10 or 25.
- convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)
- understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
- measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
- calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes
- estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)]and capacity [for example, using water]
- solve problems involving converting between units of time
- use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.
- identify 3-D shapes, including cubes and other cuboids, from 2-D representations
- know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
- draw given angles, and measure them in degrees (o)
- identify: angles at a point and one whole turn (total 3600), angles at a point on a straight line and 1/2 a turn (total 1800), other multiples of 900
- use the properties of rectangles to deduce related facts and find missing lengths and angles
- distinguish between regular and irregular polygons based on reasoning about equal sides and angles.
- identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.
- solve comparison, sum and difference problems using information presented in a line graph

Year 6 programme of study

Pupils should be taught to:
- 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 and practical problems that involve all of the above.
- 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 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 number using the formal written method of short division where appropriate, 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, an appropriate degree of accuracy.
- use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- compare and order fractions, including fractions > 1
- 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 [for example, ¼ x ½ = 1/8]
- divide proper fractions by whole numbers [for example, 1/3 divided by 2 = 1/6]
- associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8]
- identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers 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.
- 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 [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
- solve problems involving similar shapes where the scale factor is known or can be found
- solve problems involving unequal sharing and grouping using knowledge of fractions and

multiples.
- use simple formulae
- generate and describe linear number sequences
- express missing number problems algebraically
- find pairs of numbers that satisfy an equation with two unknowns
- enumerate possibilities of combinations of two variables.
- solve problems involving the calculation and conversion of units of measure, using decimal notation up 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 up to three decimal places

- convert between miles and kilometres
- recognise that shapes with the same areas can have different perimeters and vice versa
- recognise when it is possible to use formulae for area and volume of shapes
- calculate the area of parallelograms and triangles
- 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 [for example, mm^3 and km^3].
- draw 2-D 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 and know that the diameter is twice the radius
- recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.
- 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.
- interpret and construct pie charts and line graphs and use these to solve problems
- calculate and interpret the mean as an average.

CURRICULUM INTENT

At St Mary Magdalen's we recognise the unique talents and skills of all of our pupils and through our mathematics curriculum we aim to create inquisitive individuals who are empowered mathematical thinkers.

We provide a high quality, challenging and enjoyable mathematics curriculum that can be accessed by all. Our curriculum builds on consolidated mathematical skills in order for our pupils to become confident risk takers and independent learners. We aim for all of our pupils to become fluent in the fundamentals of mathematics through varied and frequent practise and provide them opportunities to apply learnt mathematical skills in different contexts across the curriculum. Mathematical skills are applied, developed and consolidated across other curriculum subjects which are linked to our locality and also through an 'active maths' programme.

Rapid and accurate recall of mathematical knowledge, skills and vocabulary is promoted throughout the school as this underpins our vision for enabling our pupils to become independent learners who can effectively reason and solve rich deep problems built on skills previously learnt.

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Through teaching with a mastery approach, children are challenged, at all levels in mathematics, and will learn to understand, distil and clarify information; consider what they know that will help them to solve problems, realising what they need to know next; create systems and strategies, organising information in a way that helps find patterns and ultimately solutions and to communicate and present their findings effectively.

Decisions about when our pupils progress is based on the security of their understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly are challenged through being offered rich and sophisticated problems before any further new content is taught. Those who are not sufficiently fluent with earlier material are allowed to consolidate their understanding including through additional practise before moving on.

We provide our pupils with the mathematical building blocks to provide a solid foundation to lead them onto secondary, further and higher education. In doing so, we instil in our pupils that mathematics is a subject which is essential to everyday life and will equip them with the necessary financial and workplace skills needed for future employment.

CURRICULUM IMPLEMENTATION

Here at St Mary Magdalen's, our implementation is developed through secure understanding of the curriculum and subject area.

PLANNING, TEACHING & LEARNING

PLANNING

Planning is largely based on White Rose small steps materials to ensure there are no gaps in mathematical understanding and follows a differentiation through depth procedure where the children are taught using a CPA approach. Children are accessing their 'catch up' curriculum also using Whiterose materials. Before the children begin a new topic, there are a sequence of lessons to support children in learning that they may have missed out on during the Covid 19 lockdown. These lessons allow children to rapidly learn/consolidate work from previous year groups, enabling them to progress and master skills in their current year group.

Planning begins from a thorough understanding of children's needs gleaned through effective and rigorous assessment and tracking, combined with high expectations and ambition for all children to achieve.

Medium term planning will outline the areas of mathematics that will be taught during the term to ensure coverage of the National Curriculum.

Planning, where possible, should involve real life contexts for maths, where children are problem solving with a purpose in mind. Class teachers should regularly plan for opportunities for children to apply their maths skills to different problems within maths lessons and across the curriculum. This will also allow children to revisit, practice and consolidate different areas of maths and apply them within different contexts. During each unit, teachers should plan at least one Active Maths lesson from Maths of the Day

to support the school's vision of achieving more active, healthy children.

There should be opportunities for all children to progress through the maths lesson together. Children should work through a system of fluency, varied fluency, reasoning and problem solving tasks and higher achievers should be provided with a rich, deep task to apply their skills and demonstrate that they have mastered the concept. Each lesson should concentrate on one concept only and children are required to deepen their mathematical understanding before moving on. Our aim is for the children to acquire, apply and deepen the mathematical skills learnt through differentiation through depth.

TEACHING AND LEARNING

In the Foundation Stage, children are given the opportunity to develop their understanding of number, measurement, pattern and shape and space through a combination of short, formal teaching as well as a range of planned structured play situations, where there is plenty of scope for exploration.

Children will become very competent 'counters' so that their fluency with the number system provides a foundation for mathematical understanding. Numbers in different representations also help to consolidate children's understanding of number and will help them to, for example, understand the 'fourness' of four. Counting forwards and backwards in many different sized steps as well as from different starting and ending points is essential.

Maths learning builds from a concrete understanding of concepts where children are manipulating objects. When children are able to see concepts this way, they then need to understand the same concepts represented pictorially. Children are then ready for abstract representation before being able to apply their knowledge to different situations. All pupils, when introduced to a key new concept, should have the opportunity to build competency in this topic by taking this approach. Pupils are encouraged to physically represent mathematical concepts. Objects and pictures are used to demonstrate and visualise abstract ideas, alongside numbers and symbols.

Concrete – children have the opportunity to use concrete objects and manipulatives to help them understand and explain what they are doing.

Pictorial – children then build on this concrete approach by using pictorial representations, which can then be used to reason and solve problems.

Abstract – With the foundations firmly laid, children can move to an abstract approach using numbers and key concepts with confidence.

Children should be encouraged at all times to communicate their understanding of maths so that it clarifies their thoughts and offers many opportunities to use correct terminology and vocabulary. Children's mental maths is of great importance, with number bonds, times tables facts and various strategies for calculation taught and practiced at school with support sought from parents through homework activities. We have five 20 minutes session during the week (outside of the maths lesson) which focuses purely on mental maths and basic skills.

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A progression towards efficient written calculations should be developed and applied consistently in each year-group. The school Calculation Posters should be followed.

EXTRA CURRICULAR MATHS OPPORTUNITIES

Our school has offered Maths after school e.g. Times tables club and Year 2 and Year 6 booster sessions and will continue to do so whenever possible. We annually celebrate National Maths Day, raising the profile of Maths in school and setting high expectations and challenges for all pupils, as well as enjoyment. Real life maths opportunities are given frequently and often link with special theme days, e.g. Children in Need day, Shrove Tuesday.

SPECIAL EDUCATIONAL NEEDS

At St Mary Magdalen's R.C. Primary School, we teach Maths to all children, whatever their ability. Maths forms part of the school curriculum policy to provide a broad and balanced education for all children. Teachers provide learning opportunities matched to the needs of children with learning difficulties and our More Able Pupils. Work in Maths takes into account the targets set for individual children in their Individual Education Support Plans.

SPIRITUAL, MORAL, SOCIAL & CULTURAL DEVELOPMENT

SPIRITUAL – The awe and wonder of mathematics is shared with the children and helps to explain the world and the mathematical patterns that occur such as the symmetry of snowflakes or the stripes of a zebra. We talk about the wow factor when the pupils make connections in maths. Examples could be investigating different number sequences and in particular the Fibonacci sequence which is evident in nature all around us. Further mathematical ideas consider the idea of infinity. There is also a sense of wonder in the exactness of mathematics as well as a sense of personal achievement in solving problems.

MORAL – We would encourage pupils to look at the use of statistics and how people manipulate them to promote their own (biased) opinions. Pupils would be encouraged to discuss the use and misuse of data in all issues including those supporting moral argument. Examples maybe with the use of questionnaires to conduct an opinion survey.

SOCIAL - Social education in Maths gives the greatest opportunity for pupils to work together collaboratively during experimental and investigative work, supporting and encouraging one another. We might look at statistics, in History or Geography lessons particular how the census is used by governments to plan for health, education and social requirements.

CULTURAL – We will encourage the pupils to appreciate the wealth of mathematics in all cultures through out history. Pupils may look at the history of maths and its development. Examples of this are how the different number and measuring systems have evolved. Pupils also look at the number systems used by other countries such as Chinese numbers and how Roman numerals are used particularly on clocks. Pupils consider the development of shape patterns around the world in particular tessellations and the symmetry of buildings. Pupils discuss the use of Mathematical language and how it is a universal language used worldwide.

CURRICULUM IMPACT

ASSESSMENT & RECORDING

At St Mary Magdalen's RCVA Primary School teachers are continually assessing pupils' progress. We see assessment as an integral part of the teaching process and strive to make our assessment purposeful, allowing us to match the correct level of work to the needs of the pupils, thus benefiting the pupils and ensuring confidence and progress. Information for assessment is gathered in a variety of ways:

- Talking to the children
- Observing and marking work
- Self and peer assessment
- Statutory and non-statutory formal assessments

Three times a week we have a two-part Maths lesson in KS2 to enable teachers to mark work and ensure that the next steps are appropriate. This may be intervention because of misunderstandings and misconceptions or maybe activities that provide challenge involving reasoning and problem solving.

Pupils' progress is recorded three times a year on the "Step Tracker". These are used to identify children who would benefit from additional support both in and out of the classroom, and lead to Intervention Strategies being devised for these children. It could also identify those children who require additional challenge in their work. Teachers track the children's progress of the new 'Non Negotiables', the basic stepping-stones to success for each class and may adjust planning to match the correct work to the needs of the children. We also use an Arithmetic scheme (currently Topical Resources) to track children's progress and attainment of these important skills.

At the end of the year, the class teacher makes a final judgement about the work of each pupil in-line with the National Curriculum in England 2014 and these are reported to parents as part of the child's annual school report.

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MONITORING & REVIEW

Monitoring of the standards of the children's work and of the quality of teaching in Maths is the responsibility of the Maths Co-ordinator alongside the Head teacher. The Co-ordinator/Head teacher monitor planning, have an annual programme of lesson observations and monitor current school targets through looking at samples of children's work. The work of the Co-ordinator involves supporting colleagues in the teaching of Maths, being informed about current developments in the subject, attending network meetings and providing a strategic lead and direction for the subject in the school. The Co-ordinator works with teachers and Head teacher in evaluating the strengths and weaknesses in the subject through an annual audit and work to target areas for further improvement. An Action Plan records the current school targets. The Co-ordinator has time allocated to review samples of the children's work, support teachers and identify further needs. The named governor responsible for Maths meets with the subject leader in order to review progress.

EXTERNAL VERIFICATION

- We have achieved the Quality Mark most recently in 2019
- External results show that attainment is in line with or above National Average
- We have worked closely with Durham Advisers on key areas for developments outlined in the School Improvement Plan.