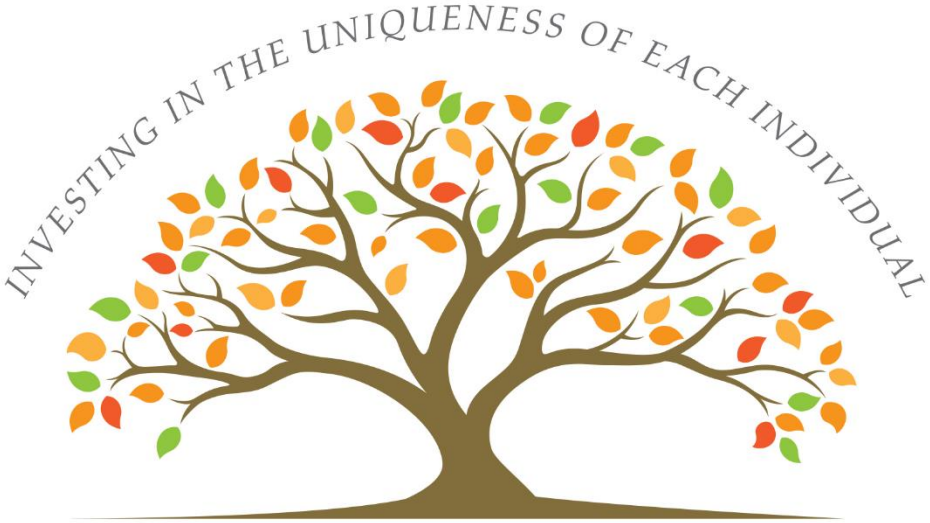

ST. MARY'S CE
PRIMARY SCHOOL

Love, Trust & Hope

Mathematics Policy

Updated March 2021 by Mrs McPhail

ST. MARY'S CE
PRIMARY SCHOOL

Contents:

Statement of intent

1. Legal framework
2. Roles and responsibilities
3. Early years provision
4. The national curriculum
5. Cross-curricular links
6. Teaching and learning
7. Planning
8. Assessment and reporting
9. Resources
10. Equal opportunities
11. Monitoring and review

Statement of intent

The 2014 National Curriculum for Maths aims to ensure that all children:

- Become fluent in the fundamentals of Mathematics
- Are able to reason mathematically
- Can solve problems by applying their Mathematics

St Mary's recognises that maths is both a key skill within school, and a life skill to be utilised through everyday experiences. We want all children to enjoy Mathematics and to experience success in the subject, as well as an appreciation of the beauty and power of Mathematics.

Through the teaching of maths, we aim to develop:

- A positive attitude towards maths and a recognition of the importance of maths in the wider world.
- The children's curiosity about the subject, through a process of enquiry and experiment.
- An ability to solve problems and think logically in order to work systematically and accurately.
- An ability to work both independently and in cooperation with others.
- Competence and confidence in pupils' maths knowledge, concepts and skills.
- An appreciation of the creative aspects of maths and an awareness of its aesthetic appeal.

Article 29: Education must develop every child's personality, talents and abilities to the full. It must encourage the child's respect for human rights, as well as respect for their parents, their own and other cultures, and the environment.

1. Legal framework

1.1. This policy has due regard to statutory guidance including, but not limited to, the following:

- DfE (2013) 'National curriculum in England: Mathematics programmes of study'
- DfE (2017) 'Statutory framework for the early years foundation stage'

2. Roles and responsibilities

2.1. The subject leader, Mrs McPhail, is responsible for:

- Preparing policy documents, curriculum plans and schemes of work for the subject.
- Reviewing changes to the national curriculum and advising on their implementation.
- Monitoring the learning and teaching of maths, providing support for staff where necessary.
- Ensuring the continuity and progression from year group to year group.
- Encouraging staff to provide effective learning opportunities for pupils.
- Through ongoing involvement in the DfE funded Maths Hubs programme, the subject leader will keep up to date on current developments in Maths education and disseminate information to colleagues, to help develop colleagues' expertise.
- Organising the deployment of resources and carrying out an annual audit of all maths-related resources.
- Liaising with teachers across all phases.
- Communicating developments in the subject to all teaching staff.
- Leading staff meetings and providing staff members with the appropriate training.
- Organising, providing and monitoring CPD opportunities in the subject.

- Ensuring common standards are met for recording and assessing pupil performance.
- Advising on the contribution of maths to other curriculum areas, including cross-curricular and extra-curricular activities.
- Collating assessment data and setting new priorities for the development of maths in subsequent years.
- The subject leader will raise the profile of Maths at St Mary's Primary School through promoting whole school participation in 'Barvember' (White Rose) and look for opportunities to apply Maths skills in real life situations eg participation in events such as 'Make £5 Grow' scheme by Virgin Media and STEM initiatives eg ' Tees Valley TrailBlazers'.
- The subject leader will extend relationships and make contacts beyond the school.
- The subject leader will identify and develop opportunities for parents/carers to become more involved in Maths education.

2.2. The classroom teacher is responsible for:

- Acting in accordance with this policy.
- Ensuring progression of pupils' mathematical skills, with due regard to the national curriculum.
- Planning lessons effectively, ensuring a range of teaching methods are used to cover the content of the national curriculum.
- Liaising with the subject leader about key topics, resources and support for individual pupils.
- Monitoring the progress of pupils in their class and reporting this on an annual basis to parents.
- Reporting any concerns regarding the teaching of the subject to the subject leader or a member of the senior leadership team (SLT).
- Undertaking any training that is necessary in order to effectively teach the subject.

2.3. The special educational needs coordinator (SENCO) is responsible for:

- Liaising with the subject leader in order to implement and develop maths throughout the school.
- Organising and providing training for staff regarding the maths curriculum for pupils with special educational needs and disabilities (SEND).
- Advising staff how best to support pupils' needs.
- Advising staff on the inclusion of mathematical objectives in pupils' individual education plans.
- Advising staff on the use of teaching assistants in order to meet pupils' needs.

2.4. The school recognises that parents and carers have a valuable role to play in supporting their child's mathematical learning.

- An overview of the Maths curriculum is available on the school's website, as well as guidance in the progression in calculation methods used by the school.
- The curriculum newsletter, sent home by each year group, also outlines the Maths topics to be covered each half term.
- Parents and carers are encouraged to speak to their child's Maths teacher at any point during the year, either informally or by making a specific appointment.

3. Early years provision

3.1.The curriculum for EYFS should underpin all future learning by supporting, fostering, promoting and developing children's mathematics with opportunities to develop their understanding of number, measurement, pattern, shape and space, by providing a broad range of contexts in which they can explore, enjoy, learn, practise and talk about them.

3.2. The overall aim of the Foundation Stage for Mathematics is that children achieve the Early Learning Goals and work towards a dedicated maths session each day, in preparation for Key Stage One.

3.3.Throughout the week a child will work with an adult - either a teacher or a supporting adult - on a task. This supports assessment on a daily basis, as well as providing individual feedback to children, ensuring that children receive immediate intervention as required during the supported focus activity.

3.4. In addition to these planned independent activities, children also have the opportunity to self-select Maths resources to consolidate their learning during child-initiated activities. We recognise the importance of play-based learning and therefore encourage children to develop their understanding during their play. Such opportunities are provided in both the inside and outside environment.

3.5. In Reception, the children are introduced to a three part lesson. This consists of:

1. Whole class oral and mental starter.
2. Whole class main teaching.
3. Focus activity.

3.6. During EYFS, pupils will be taught to:

- Count with numbers from 1 to 20, placing them in order and naming the number that is one more or less than a given number.
- Use quantities and objects to add and subtract two single-digit numbers, and count forwards or backwards to find the answer.
- Solve problems, including doubling, halving and sharing.
- Use everyday language to talk about size, weight, capacity, position, distance, time and money in order to compare quantities and objects, and solve problems.
- Recognise, create and describe patterns.
- Use mathematical language to describe everyday objects and shapes.
- The children are taught these concepts using physical resources, pictorial resources, songs, games and role-play.

4. The national curriculum

4.1. The national curriculum is followed and provides a full breakdown of the statutory content to be taught within each unit.

4.2. **Implementation**: The content and principles underpinning the 2014 Mathematics curriculum and the Maths curriculum at St Mary's reflect those found in high-performing education systems internationally, particularly those of east and south-east Asian countries such as Singapore, Japan, South Korea and China.

4.3. These principles and features characterise this approach and convey how our curriculum is implemented:

• Teachers reinforce an expectation that all children are capable of achieving high standards in Mathematics.

• The large majority of children progress through the curriculum content at the same pace. Differentiation is achieved by emphasising deep knowledge and through individual support and intervention.

• Teaching is underpinned by methodical curriculum design and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge.

• Practice and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts.

• Teachers use precise questioning in class to test conceptual and procedural knowledge and assess children regularly to identify those requiring intervention, so that all children keep up.

4.4. To ensure whole school consistency and progression, the school uses the DfE approved 'Power Maths' scheme. This is fully aligned with the White Rose Maths scheme and the school's ongoing engagement with the DFE funded Maths Hubs programme continues to ensure that staff understand the pedagogy of the approach.

4.5. Mathematical topics are taught in blocks, to enable the achievement of 'mastery' over time. Each lesson phase provides the means to achieve greater depth, with more able children being offered rich and sophisticated problems, as well as exploratory, investigative tasks, within the lesson as appropriate.

4.6. **In Year 1, pupils will be taught to:**

- **Number and place value**
  - Count to 100, forwards and backwards, beginning with 0 or 1, from any number.
  - Count, read, and write numbers from 1 to 100.
  - Count in multiples of 2, 5, and 10.
  - Identify one more and one less from a number.

- Identify and represent numbers using objects and pictures (using a number line) and use language of: equal to, more than, less than (fewer), most, least.
- Read and write numbers from 1 to 20 in numerals and words.

- **Addition and subtraction**
  - Read, write, and interpret statements involving addition, subtraction, and equals signs.
  - Represent and use number bonds and related subtraction facts within 20.
  - Add and subtract one and two-digit numbers to 20, including 0.
  - Solve one-step problems which involve addition and subtraction.

- **Multiplication and division**
  - Solve one-step problems using multiplication and division, calculating the answer using concrete objects and pictorial representations.

- **Fractions**
  - Recognise, find and name a half as 1 of 2 equal parts.
  - Recognise, find and name a quarter as 1 of 4 equal parts.

- **Measurement**
  - Compare, describe and solve practical problems for lengths and heights, weight, time, capacity and volume.
  - Measure and begin to record lengths and heights, weight, time, capacity and volume.
  - Recognise and know the value of different denominations of coins and notes.
  - Sequence events in chronological order using language.
  - 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.

- **Properties of shapes**
  - Recognise and name common 2D and 3D shapes.

- **Position and direction**
  - Describe position, direction and movement, including whole, half, quarter and three-quarter turns.

4.7. **In Year 2, pupils will be taught to:**

- **Number and place value**
    - Count in steps of two, three and five from 0, and in 10s from any number, forwards and backwards.
    - Recognise the place value of each digit in a two-digit number.
    - Identify, represent and estimate numbers using different depictions, including the number line.
    - Compare and order numbers from 0 to 100, using q, G and = signs.
    - Read and write numbers 1 to 100 in numerals and words.
    - Use place value and number facts to solve problems.

- **Addition and subtraction**
    - Solve problems with addition and subtraction using concrete objects and pictorial representations.
    - Apply increasing knowledge of mental and written methods.
    - Recall and use addition and subtraction facts to 20, 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 1s, a two-digit number and 10s, two two-digit numbers, and adding three one-digit numbers.
    - Show that the addition of two numbers can be done in any order 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.

- **Multiplication and division**
    - Recall and use multiplication and division facts for the 2, 5, and 10 multiplication tables.
    - Recognise odd and even numbers.
    - Calculate mathematical statements for multiplication and division within the multiplication tables and write them using x, ÷, and = signs.
    - Show that multiplication of two numbers can be done in any order, 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.

- **Fractions**

- Recognise, find, name, and write fractions of a length, shape, set of objects or quantity.
- Write simple fractions and recognise their equivalence, e.g. $\frac{1}{2}$ and $\frac{2}{4}$.

- **Measurement**
  - Choose and use appropriate standard units to estimate and measure length/height in any direction, mass, temperature, and capacity to the nearest appropriate unit.
  - Compare and order lengths, heights, mass, volume/capacity, and record the results using G, q and =.
  - Recognise and use symbols for pounds (£) and pence (p), and 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, e.g. giving change.
  - Compare and order 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.

- **Properties of shapes**
  - Identify and describe the properties of 2D shapes, including the number of sides, and line symmetry in a vertical line.
  - Identify and describe the properties of 3D shapes, including the number of edges, vertices and faces.
  - Identify 2D shapes on the surface of 3D shapes.
  - Compare and sort common 2D and 3D shapes using everyday objects.

- **Position and direction**
  - 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, distinguishing between rotation as a turn, and in terms of right angles for quarter, half and three-quarter turns.

- **Statistics**

- Interpret and construct simple pictograms, tally charts, block diagrams and 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 data.

4.8. **In Year 3, pupils will be taught to:**

- **Number and place value**
  - Count from 0 in multiples of 4, 8, 50 and 100, finding 10 or 100 more or less than a given number.
  - Recognise the place value of each digit in a 3-digit number (100s, 10s, 1s).
  - Compare and order numbers up to 1,000.
  - Identify, represent and estimate numbers using different representations.
  - Read and write numbers up to 1,000 in numerals and in words.
  - Solve number problems and practical problems involving these concepts.

- **Addition and subtraction**
  - Add and subtract numbers mentally, including a three-digit number and 1s, a three-digit number and 10s, and a three-digit number and 100s.
  - 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 reverse operations to check answers.
  - Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

- **Multiplication and division**
  - 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, including for two-digit numbers times one-digit numbers, using mental maths 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.

- **Fractions**
    - Distinguish what tenths are.
    - Count up and down in tenths.
    - Distinguish, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.
    - Distinguish and use fractions as numbers: unit fractions and non-unit fractions with small denominators.
    - Distinguish and show, using diagrams, equivalent fractions with small denominators.
    - Add and subtract fractions with the same denominator within one whole.
    - Compare and order unit fractions, and fractions with the same denominators.
    - Solve problems that involve all of the above.

- **Measurement**
    - Measure, compare, add and subtract lengths, mass, volume/capacity.
    - Measure the perimeter of simple 2D shapes.
    - Add and subtract amounts of money to give change.
    - 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, record, compare and read times, with increasing accuracy to the nearest minute.
    - Use vocabulary such as o'clock, am/pm, morning, afternoon, noon, and midnight.
    - Distinguish the number of seconds in a minute and the number of days in each month, year and leap year.
    - Compare the durations of events.

- **Properties of shapes**
    - Draw 2D shapes and make 3D shapes using modelling materials; recognise 3D shapes in different orientations and describe them.
    - Recognise angles as a property of a shape or a description of a turn.
    - Identify right angles and distinguish 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.

- **Statistics**
    - Show data using bar charts, pictograms and tables.
    - Solve one and two-step data using bar charts, pictograms and tables.

4.9. **In Year 4, pupils will be taught to:**

- **Number and place value**
    - Count in multiples of 6, 7, 9, 25 and 1,000.
    - Find 1,000 more or less than a chosen number.
    - Count negative numbers from 0.
    - Recognise place value of each digit of a four-digit number.
    - Recognise, represent and estimate numbers using different representations.
    - Round any number to the nearest 10, 100 or 1,000.
    - Solve number and practical problems that involve all of the above, and with increasingly large numbers.
    - Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of 0 and place value.

- **Addition and subtraction**
    - Add and subtract numbers with up to four digits using formal written methods, and columnar addition and subtraction where necessary.
    - Estimate and use inverse operations to check the answers to a calculation.
    - Solve addition and subtraction two-step problems in different contexts, deciding which operations to use and why.

- **Multiplication and division**
    - Use multiplication and division facts for tables up to 12x12
    - Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and one; dividing by one; 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 connected to 'm' objects.

- **Fractions (including decimals)**
  - 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 100 and dividing tenths by 10.
  - 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.
  - Identify and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$
  - 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.

- **Measurement**
  - Convert between different units of measurement.
  - Measure and calculate the perimeter of a rectilinear figure 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.

- **Properties of shapes**

- Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.
- Recognise acute and obtuse angles, and compare and order angles – up to two right angles – by size.
- Recognise lines of symmetry in 2D shapes presented in different orientations.
- Complete a simple symmetric figure with respect to a specific line of symmetry.

- **Position and direction**
  - Describe positions on a 2D 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.

- **Statistics**
  - 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.

4.10. **In Year 5, pupils will be taught to:**

- **Number and place value**
  - 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 0.
  - Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000.
  - Solve number problems and practical problems that involve all of the above.
  - Read Roman numerals to 1,000 (M) and recognise years written in Roman numerals.

- **Addition and subtraction**

- Add and subtract whole numbers with more than four digits, including using formal written methods.
- Add and subtract numbers mentally using 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 context, deciding which operations and methods to use and why.

- **Multiplication and division**
  - Recognise 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 non-prime numbers.
  - Establish whether a number up to 100 is prime and recall prime numbers up to 19.
  - Multiply numbers up to four 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.
  - Divide numbers up to four 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 1,000.
  - Identify and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}).
  - Solve problems involving multiplication and division, including using 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.

- **Fractions (including decimals and percentages)**
  - 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, know how to convert from one form to the other, and write mathematical statements greater than one as a mixed number.
- 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.
- 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 numbers with up to three decimal places.
- Recognise the percent symbol (%) and understand that percent relates to 'number of parts per 100,' writing percentages as a fraction with a denominator of 100, and as a decimal fraction
- 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.

- **Measurement**
  - Convert between different units of metric measurement.
  - 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, including using standard units, square centimetres (cm^2) and square metres (m^2), and estimate the area of irregular shapes.
  - Estimate volume and capacity.
  - Solve problems involving converting between units of time.
  - Use all four operations to solve problems involving measure using decimal notation, including scaling.

- **Properties of shapes**
  - Identify 3D shapes, including cubes and other cuboids, from 2D representations.
  - Know that angles are measured in degrees, and estimate and compare acute, obtuse and reflex angles.

- Draw given angles, and measure them in degrees (°).
- Identify angles at a point and 360° (one whole turn), angles at a point on a straight line and 180° (half a turn), and other multiples of 90°.
- 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.

- **Position and direction**
  - 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.

- **Statistics**
  - Solve comparison, sum and difference problems using information presented in a line graph.
  - Complete, read and interpret information in tables, including timetables.

4.11. **In Year 6, pupils will be taught to:**

- **Number 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 0.
  - Solve numerical and practical problems that involve all of the above.

- **Addition, subtraction, multiplication and division**
  - Multiply multi-digit numbers of up to four digits by a two-digit whole number using the formal written method of long multiplication.
  - Divide numbers of up to four 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 of up to four 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 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.

- **Fractions (including decimals and percentages)**
  - Use common factors to simplify fractions, and use common multiples to express fractions in the same denomination.
  - Compare and order fractions, including fractions greater than one.
  - 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.
  - Divide proper fractions by whole numbers.
  - Associate a fraction with division and calculate decimal fraction equivalents for a simple fraction.
  - Identify the value of each digit in numbers given to three decimal places, and multiply and divide numbers by 10, 100 and 1,000 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.

- **Ratio and proportion**
  - 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 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.

- **Algebra**
  - 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.

- **Measurement**
  - 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 the volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extend to other units.

- **Properties of shapes**
  - Draw 2D shapes using given dimensions and angles.
  - Recognise, describe and build simple 3D 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.

- **Position and direction**
    - Describe positions on the full coordinate grid.
    - Draw and translate simple shapes on the coordinate grid, and reflect them in the axes.

- **Statistics**
    - Interpret and construct pie charts and line graphs, and use these to solve problems.
    - Calculate and interpret the mean as an average.

These aims promote and ensure that the following articles of the Rights of the Child are adhered to and respected:

- ***Article 28****: Every child has the right to an education. Primary education must be free and different forms of secondary education must be available to every child. Discipline in schools must respect children's dignity and their rights. Richer countries must help poorer countries achieve this*
- ***Article 29****: Education must develop every child's personality, talents and abilities to the full. It must encourage the child's respect for human rights, as well as respect for their parents, their own and other cultures, and the environment.*

5. Cross-curricular links

5.1. Wherever possible, the maths curriculum will provide opportunities to establish links with other curriculum areas.

5.2. **English**

- Mathematical terminology is used, where appropriate.

5.3. **Science**

- Pupils' data collection and analysis skills are further developed through the conduction of physical experiments, using units of measurement, calculating averages and interpreting results.

- Pupils record their finding using charts, tables and graphs.

5.4. **Humanities**

- Data analysis, pattern seeking and problem-solving skills are developed through the teaching of geography.

- Pupils' understanding of time and measurements of time are developed through discussions of historical events.

5.5. **Computing**

- Pupils are encouraged to use calculators and other electronical devices, gaining confidence throughout their school experience.
- Computing will be used to enhance pupils' maths skills through the use of online resources eg Times Table Rockstars and SATS Companion and the creation of spreadsheets.
- Computing will be used to record findings, using text, data and tables.

6. Teaching and learning

6.1. Pupils will be taught to describe key characteristics and associated processes in common language, as well as understand and use technical terminology and specialist vocabulary.

6.2. Pupils will undertake independent work, and have the opportunity to work in groups and discuss work with fellow classmates.

6.3. Lessons will allow for a wide range of mathematical, enquiry-based research activities, including the following:

- Questioning, predicting and interpreting
- Pattern seeking
- Collaborative work
- Problem-solving activities
- Classifying and grouping

6.4. Lessons will involve the use of a variety of sources, including data, statistics, graphs and charts.

6.5. The classroom teacher, in collaboration with the subject leader, will ensure that the needs of all pupils are met by:

- Setting tasks which can have a variety of responses.
- Providing resources of differing complexity, according to the ability of the pupils.
- Utilising teaching assistants to ensure that pupils are effectively supported.

6.6. A maths mastery approach is taken to the curriculum, in which fluency comes from deep knowledge and practice. This means that structured questioning is

used to ensure that pupils develop fluent technical proficiency and think deeply about the underpinning mathematical concepts.

6.7. Focus is put on the development of deep structural knowledge and the ability to make connections, with the aim of ensuring that what is learnt is sustained over time.

6.8. A typical lesson using Power Maths lasts approximately 1 hour. Children begin with a short 'Power Up' activity which supports fluency in and recall of number facts. Following this, the main lesson begins with a 'Discover' and 'Share' task in which a contextual problem is shared for the children to discuss in partners. This helps promote discussion and ensures that mathematical ideas are introduced in a logical way to support conceptual understanding. In KS1, these problems are almost always presented with objects (concrete manipulatives) for children to use. Children may also use manipulatives in KS2.

6.9. Teachers use careful questions to draw out children's discussions and their reasoning and the children learn from misconceptions through whole class reasoning. Following this, the children are presented with varied similar problems, which they might discuss with a partner or within a small group. At this point, scaffolding is carefully reduced to prepare children for independent practice. This is the 'Think together' part of the lesson and the children might record some of their working out in their Maths books or on a mini whiteboard. The teacher uses this part of the lesson to address any initial errors and confirm the different methods and strategies that can be used. The children are then shown a 'challenge', which promotes a greater depth of thinking.

6.10. The class then progress to the 'Practice' part of the lesson, which is designed to be completed independently. This practice uses conceptual and procedural variation to build fluency and develop greater understanding of underlying mathematical concepts. A challenge question and links to other areas of Maths encourages children to take their understanding to a greater level of depth. Children who complete this are provided with further 'rich and sophisticated' problems either from the White Rose Maths Small Steps guidance, or the PowerMaths Deepening Understanding activities which they complete in their own maths book. The final part of the sequence is a 'reflect' task. This is an opportunity for children to review, reason and reflect on learning and enables the teacher to gauge their depth of understanding.

6.11. 'Fluent In Five' is an extra 5 minute Mental Maths session twice a week from Y4 -6. The aim is to help children continuously practise the four basic operations of addition, subtraction, division and multiplication and also

consolidate skills from other areas of the maths curriculum through repetition and hearing the explanation of their thinking behind the oral responses given.

6.12. In Key Stage 2, the Schofield and Sims book scheme continues to be used, where children will draw upon existing knowledge to answer questions across the breadth of maths; this is also based on children's ability rather than age.

6.13. Timestable Rockstars has been introduced in order to encourage fluent recall of times table facts. Opportunities are timetabled in the week in order for the children to practise times tables using this resource eg for interventions and the children are encouraged to practise at home online too. Weekly tests are given in KS2 and results are recorded in the back of their Maths book. In KS1, the children practise regularly each week in counting orally in multiples of 2,5,10, etc.

6.14. **Impact**: The school has a supportive ethos and our approaches support the children in developing their collaborative and independent skills, as well as empathy and the need to recognise the achievement of others. Students can underperform in Mathematics because they think they can't do it or are not naturally good at it. At St Mary's, we aim to address these preconceptions by ensuring that all children experience challenge and success in Mathematics by developing a growth mindset.

7. Planning

7.1. All relevant staff members are briefed on the school's planning procedures as part of their staff training.

7.2. Throughout St Mary's, maths is taught as a discrete lesson and as part of cross-curricular themes when appropriate.

7.3. Teachers will use the key learning content in the DfE's statutory guidance 'National curriculum in England: mathematics programmes of study', published in 2014.

7.4. The school has implemented a blocked curriculum approach to the teaching of Mathematics. This ensures that children are able to focus for longer on each specific area of Maths and develop a more secure understanding over time. This approach is also designed to enable children to progress to a greater depth of understanding. Subsequent blocks continue to consolidate previous learning so that the children continually practise key skills and are able to recognise how different aspects of Maths are linked.

7.5. Lesson plans will demonstrate a balance of interactive and independent elements used in teaching, ensuring that all pupils engage with their learning.

7.6. There will be a clear focus on direct, instructional teaching and interactive oral work with the whole class and targeted groups.

7.7. Teachers will ensure that all maths lessons include a focus on mental calculation.

7.8. Power Maths long-term planning will be used to outline the units to be taught within each year group and also to match PowerMaths to the Ready To Progress criteria, so that the most important conceptual knowledge and understanding is identified that pupils need as they progress from Y1 to Y6.

7.9. Power Maths medium-term planning will be used to outline the vocabulary and skills that will be taught in each unit of work, as well as highlight the opportunities for assessment.

7.10. Medium-term plans will identify learning objectives to ensure there is progression between years.

7.11. Power Maths short-term planning will be used flexibly to reflect the objectives of the lesson, the success criteria and the aims of the next lesson.

7.12. Short-term planning is the responsibility of the teacher. This is achieved by building on their medium-term planning, taking into account pupils' needs and identifying the method in which topics could be taught.

7.13. All lessons will have clear learning objectives, which are shared and reviewed with pupils.

7.14. Homework will be set on a weekly basis and will build on that week's lesson objectives.

7.15. Homework can take a variety of formats, including mental maths tasks, games, data analysis activities and written tasks.

8. Assessment and reporting

8.1. Regular and ongoing assessment informs teaching, as well as intervention, to support and enable the success of each child. The structure of the teaching sequence ensures that children know how to be successful in their independent work.

8.2. Pupils aged between two and three will be assessed in accordance with the 'Statutory framework for the early years foundation stage', in order to identify a pupil's strengths and identify areas where progress is less than expected.

8.3. An EYFS Profile will be completed for each pupil in the final term of the year in which they reach age five.

8.4. The progress and development of pupils within the EYFS is assessed against the early learning goals outlined in the 'Statutory framework for the early years foundation stage'.

8.5. Assessment will be undertaken in various forms, including the following:

- Talking to pupils and asking questions
- Discussing pupils' work with them
- Marking work against the learning objectives
- Pupils' self-evaluation of their work, including the Reflect tasks allow for misconceptions to be addressed
- Classroom tests and formal exams

8.6. **Formative Assessment**:

- Common misconceptions are addressed within the teaching sequence and key understanding within each 'small step' is reviewed and checked by the teacher and the children before progression to further depth.
- At the end of the lesson, the children review their work and self and peer assessment are used consistently as outlined by the school's 'Marking and Feedback Policy'. The children indicate how confident they feel about their learning alongside the learning intention for that lesson.
- This is reviewed by the teacher during a review of the children's work to inform where consolidation might be required.
- Opportunities for additional practice and correction are provided by the teacher, as appropriate, during marking, with a focus on promoting and achieving a growth mindset within the subject.
- At the end of each blocked unit of work, the children also complete the Power Maths 'End of Unit Assessment'.
- The outcome of this is used by the teacher to ensure that any identified gaps in understanding can be addressed.
- Each child's scores are input onto a class spreadsheet, which provides an overview of achievement in each specific area within the programme of study. This also informs dialogue with parents and carers during open evenings, as well as the judgements made at the end of the term as to the extent that each child has demonstrated mastery of each 'fundamental' objective in order to inform interventions and also

ensure that provision remains well-informed to enable optimum progress and achievement.

- Self and peer assessment promotes:

Article 12: Every child has the right to express their views, feelings and wishes in all matters affecting them, and to have their views considered and taken seriously. This right applies at all times, for example during immigration proceedings, housing decisions or the child's day-to-day home life.

Article 13: Every child must be free to express their thoughts and opinions and to access all kinds of information, as long as it is within the law.

8.7. **Summative assessment:**

- Assessment data in maths is reviewed throughout the year.
- Teachers administer a termly Rising Stars Arithmetic paper and Reasoning and Problem-Solving paper to measure each pupil's attainment in all areas of maths. These results will be compared with an 'average' for all pupils of that age and used to identify children's ongoing target areas, which are communicated to the children, as well as to parents and carers at Parents Evening.
- They are also used alongside Power Maths end of unit assessments and outcomes of work, to inform the whole school tracking of attainment and progress for each child on Scholarpack.
- The results of end-of-year assessments will be passed to relevant members of staff, such as the pupil's future teacher, in order to demonstrate where pupils are at a given point in time.
- End of year data is also used to measure the extent to which attainment gaps for individuals and identified groups of learners are being closed. This data is used to inform whole school and subject development priorities for the next school year.
- Parents will be provided with a written report about their child's progress during the Summer term every year. These will include information on the pupil's attitude towards maths, understanding of mathematical terminology, investigatory skills and the knowledge levels they have achieved.
- Verbal reports will be provided at parent-teacher interviews during the Autumn and Spring terms.
- The progress of pupils with SEND is monitored by the SENCO.
- These factors ensure that we are able to maintain high standards, with a number of children demonstrating greater depth at the end of each phase.

9. Resources

9.1. The use of Mathematics resources is integral to the concrete – pictorial – abstract approach and thus planned into teaching and learning. The school has a variety of equipment and resources, both tangible and ICT based, to support teaching and motivate children's learning.

9.2. The subject leader is responsible for the management and maintenance of maths resources, as well as for liaising with the school business manager in order to purchase further resources.

9.3. Maths resources will be stored in each classroom.

9.4. Maths Working walls will be utilised and updated regularly, in accordance with the area of maths being taught at the time.

9.5. Maths equipment and resources will be easily accessible to pupils during lessons.

9.6. Resources are used by our teachers and children in a number of ways including:

- Demonstrating or modelling an idea, an operation or method of calculation.
- Enabling children to use a calculation strategy or method that they couldn't do without help, by using any of the above or other resources as required.

9.7. An interactive teaching tool for the purpose of modelling strategies is available to all teachers as part of the Power Maths scheme.

9.8. Resources to support teachers' own professional development and understanding of new approaches as part of a mastery approach are available on the Power Maths 'ActiveLearn' platform. As well as overviews of learning, these include short videos, which demonstrate new methods to ensure accuracy. Teachers also use a variety of resources online to help support and challenge the children within the class lesson, or for an intervention, eg NCETM Exemplification of Ready To Progress criteria, Classroom Secrets and White Rose materials.

9.9. High quality textbooks and practice books, approved by the DfE, as part of the national approach to teaching for mastery are used in each year group and a digital version of the Power Maths textbooks allows these to be shared with the class, during the main teaching.

9.10. Teachers are encouraged to use the school playgrounds as an outdoor classroom when possible, for example, when teaching length, area or perimeter.

9.11. The subject leader will undertake an audit of maths equipment and resources on an annual basis.

9.12. When choosing resources for Maths lessons, teachers must make sure that the following Right of the Child is respected:

Article 17 (access to information from the media) Every child has the right to reliable information from a variety of sources, and governments should encourage the media to provide information that children can understand. Governments must help protect children from materials that could harm them.

10. Equal opportunities

10.1. All pupils will have equal access to the maths curriculum.

10.2. Gender, learning ability, physical ability, ethnicity, linguistic ability and/or cultural circumstances will not impede pupils from accessing all maths lessons.

10.3. Where it is inappropriate for a pupil to participate in a lesson because of reasons related to any of the factors outlined above, the lessons will be adapted to meet the pupil's needs and alternative arrangements involving extra support will be provided where necessary.

10.4. All efforts will be made to ensure that cultural and gender differences will be positively reflected in all lessons and teaching materials used.

10.5. Taking a mastery approach, differentiation occurs in the support and intervention provided to different children, not in the topics taught, particularly at earlier stages.

10.6. There is little differentiation in the content taught but the questioning and scaffolding individual children receive in class as they work through problems will differ, with higher attainers challenged through more demanding problems, which deepen their knowledge of the same content before acceleration onto new content.

St Mary's aims to provide more academically-able pupils with the opportunity to extend their mathematic thinking through extension activities such as problem solving, investigative work and research of a mathematic nature.

Article 23: A child with a disability has the right to live a full and decent life with dignity and, as far as possible, independence and to play an active part in the community. Governments must do all they can to support disabled children and their families.

11. Monitoring and review

11.1. This policy will be reviewed on an annual basis by the subject leader.

11.2. The subject leader will monitor teaching and learning in the subject St Mary's, ensuring that the content of the national curriculum is covered across all phases of pupils' education.

11.3. The Maths Link Academy Councillor is briefed to oversee the teaching of numeracy, and meets regularly with the subject leader to review progress.

11.4. Any changes made to this policy will be communicated to all teaching staff.

Policy written by: T.McPhail

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