St. Thomas'
CofE PRIMARY ACADEMY
Learning for life with Jesus

Maths Policy

2022-2023

Contents:

Statement of intent

Why do we teach mathematics at St. Thomas'?

'Our learning in mathematics gives us life skills, which we use and will use every day. (Year 5 Pupil)

Mathematics is a statutory core subject in the Primary National Curriculum 2014. High quality mathematics teaching and learning provides children with opportunities to develop problem solving skills and the ability to reason and make sense of their world. Children should be given the opportunity to explore their learning, follow their sense of curiosity and engage and enjoy the subject, whilst celebrating learning successes. Children recognise and understand how the skills they learn in mathematics will serve them in real life situations.

Aims of the National Curriculum 2014

The National Curriculum aims to ensure that all pupils

-Become fluent in the fundamentals of mathematics, including through varied and frequent practise with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.

- Reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.

- Can solve problems by applying their mathematics to a variety of routine and non routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

(National Curriculum 2014)

Legal framework

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

- DfE (2021) 'National curriculum in England: Mathematics programmes of study'
- DfE (2021) 'Statutory framework for the early years foundation stage'
- DfE (2021) 'Teaching mathematics in primary schools'

Roles and responsibilities

The maths lead is responsible and trusted to:

- 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.
- Helping to develop colleagues' expertise in the subject.
- 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 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 maths lead 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 maths lead or a member of the SLT.
- Undertaking any training that is necessary in order to effectively teach the subject.

The SENCO is responsible for:

- Liaising with the maths lead in order to implement and develop maths throughout the school.
- Organising and providing training for staff regarding the maths curriculum for pupils with 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.

Early years provision

Activities and experiences for pupils will be based on the seven areas of learning and development, as outlined in the DfE's 'Statutory framework for the early years foundation stage'.

Provision for early years pupils focusses on the following prime areas:

- Literacy
- Maths
- Understanding the world
- Expressive arts and design

Activities will provide pupils with the opportunity to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems, and describing shapes, spaces and measurements.

All activities will adhere to the objectives set out in the framework.

Children will learn how to:

- Count confidently.
- Develop a deep understanding of the numbers to 10.
- Understand the relationship between numbers and the patterns within those numbers.
- Develop a secure base knowledge of vocabulary from which mastery of mathematics is built.
- Develop their spatial reasoning skills across all areas of mathematics including, shape, space and measures.
- Develop positive attitudes and interests in mathematics.
- Look for patterns and relationships.
- Spot connections.
- Talk to adults and peers about what they notice and not be afraid to make mistakes.

The national curriculum

The below demonstrates the 'ready-to-progress' criteria across all year groups and is not exhaustive of everything children will learn through the curriculum.

In Year 1, pupils will be taught to:

Number and place value

- Count within 100, forwards and backwards, beginning with any number.
- Reason about the location of numbers to 20 within the linear number system, including comparing using < > and =.

Number facts

- Develop fluency in addition and subtraction facts within 10.
- Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple and count forwards and backwards through the odd numbers.

Addition and subtraction

- Read, write and interpret equations containing addition, subtraction and equals symbols, and relate additive expressions and equations to real-life contexts.
- Compose numbers to 10 from two parts and partition numbers to 10 into parts, including recognising odd and even numbers.

Geometry

- Recognise and name common 2D and 3D shapes presented in different orientations and know that rectangles, triangles, cuboids and pyramids are not always similar to one another
- Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations.

In Year 2, pupils will be taught to:

Number and place value

- Recognise the place value of each digit in two-digit numbers, and compose and decompose two-digit numbers using standard and non-standard partitioning.
- Reason about the location of any two-digit number in the linear number system, including identifying the previous and next multiple of 10.

Number facts

- Secure fluency in addition and subtraction facts within 10 through continued practice.

Addition and subtraction

- Add and subtract across 10.
- Recognise the subtraction structure of 'difference' and answer questions of the form "How many more?"

- Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only 1s or only 10s to or from a two-digit number.
- Add and subtract within 100 by applying related one-digit addition and subtraction facts.
- Add and subtract any two-digit numbers.

Multiplication and division

- Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables.
- Relate grouping problems where the number of groups is unknown to multiplication equations within a missing factor, and to division equations.

Geometry

- Use precise language to describe the properties of 2D and 3D shapes, and compare shapes by reasoning about similarities and differences in properties.

In Year 3, pupils will be taught to:

Number and place value

- Divide 100 into 2, 3, 5 and 10 equal parts and read scales/number lines marked in multiples of 100 with 2, 4,5 and 10 equal parts.

Number facts

- Secure fluency in addition and subtraction facts that bridge 10, through continued practice.
- Recall multiplication facts and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.
- Apply place-value knowledge to known additive and multiplicative number facts.

Addition and subtraction

- Calculate complements to 100.
- Add and subtract up to three-digit numbers using columnar methods.
- Manipulate the additive relationship:
    - Understand the inverse relationship between addition and subtraction and how both relate to the part-part-whole structure.
    - Understand and use the commutative property of addition, and understand the related property for subtraction.

Multiplication and division

- Apply known multiplication and division facts to solve contextual problems with different structures, including quotative and partitive division.

Fractions

- Interpret and write proper fractions to represent one or several parts of a whole that is divided into equal parts.
- Find unit fractions of quantities using known division facts.
- Reason about the location of any fraction within one in the linear number system.
- Add and subtract fractions with the same denominator, within one.

Geometry

- Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations.
- Draw polygons by joining marked points and identify parallel and perpendicular sides.

In Year 4, pupils will be taught to:

Number and place value

- Know that 10 hundreds are equivalent to 1 thousand and that 1,000 is 10 times the size of 100 and apply this to identify and work out how many 100s there are in other four-digit multiples of 100.
- Recognise the place value of each digit in four-digit numbers using standard and non-standard partitioning.
- Reason about the location of any four-digit number in the linear number system including identifying the previous and next multiple of 1,000 and 100, and rounding to the nearest of each.
- Divide 1,000 into 2, 4, 5 and 10 equal parts and read scales/number lines marked in multiples of 1,000 with 2, 4, 5 and 10 equal parts.

Number facts

- Recall multiplication and division facts up to 12 x 12 and recognise products in multiplication tables as multiples of the corresponding number.
- Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders and interpret remainders appropriately according to the context.
- Apply place-value knowledge to known additive and multiplicative number facts.

Multiplication and division

- Multiply and divide whole numbers by 10 and 100 and understand this as equivalent to making a number 10 or 100 times the size.
- Manipulate multiplication and division equations and understand and apply the commutative property of multiplication.
- Understand and apply the distributive property of multiplication.

Fractions

- Reason about the location of mixed numbers in the linear number system.
- Convert mixed numbers to improper fractions and vice versa.
- Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers.

Geometry

- Draw polygons, specified by coordinates in the first quadrant and translate within the first quadrant.
- Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal.
- Find the perimeter of regular and irregular polygons.
- Identify line symmetry in 2D shapes presented in different orientations.
- Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry.

In Year 5, pupils will be taught to:

Number and place value

- Know that 10 tenths are equivalent to 1 one and that 1 is 10 times the size of 0.1.
- Know that 100 hundredths are equivalent to 1 one and that 1 is 100 times the size of 0.01.
- Know that 10 hundredths are equivalent to 1 tenth and that 0.1 is 10 times the size of 0.01.
- Recognise the place value of each digit in numbers with up to 2 decimal places and compose and decompose numbers with up to 2 decimal places using standard and non-standard partitioning.
- Reason about the location of any number with up to 2 decimal places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each.
- Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts.
- Convert between units of measures including using common decimals and fractions.

Number facts

- Secure fluency in multiplication table facts and corresponding division facts, through continues practice.
- Apply place-value knowledge to known additive and multiplicative number facts.

Multiplication and division

- Multiply and divide numbers by 10 and 100 and understand this as equivalent to making a number 10 or 100 times the size or 1 tenth or 1 hundredth times the size.
- Find factors and multiples of positive whole numbers, including common factors and common multiples and express a given number as a product of 2 or 3 factors.
- Multiply any whole number with up to four digits by any one-digit number using a formal written method.
- Divide a number with up to 4 digits by a one-digit number using a formal written method and interpret remainders appropriately for the context.

Fractions

- Find non-unit fractions of quantities.
- Find equivalent fractions and understand that they have the same value and the same position in the linear number system.
- Recall decimal fraction equivalents for $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$ and $\frac{1}{10}$, and for multiples of these proper fractions.

Geometry

- Compare angles, estimate and measure angles in degrees and draw angles of a given size.
- Compare areas and calculate the area of rectangles using standard units.

In Year 6, pupils will be taught to:

Number and place value

- Understand the relationship between powers of 10 from 1 hundredth to 10 million and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size.
- Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning.
- Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system and round numbers, as appropriate, including in contexts.
- Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.

Addition, subtraction, multiplication and division

- Understand that 2 numbers can be related additively or multiplicatively and quantify additive and multiplicative relationships.
- Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships and place-value understanding.
- Solve problems involving ratio relationships.
- Solve problems with 2 unknowns.

Fractions

- Recognise when fractions can be simplified and use common factors to simplify fractions.
- Express fractions in a common denomination and use this to compare fractions that are similar in value.
- Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy.

Geometry

- Draw, compose and decompose shapes according to given properties, including dimensions, angles and area and solve related problems.

Cross-curricular links

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

English

Mathematical terminology is used, where appropriate. Maths-based texts are sometimes used in English lessons and in guided reading sessions.

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.

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.

Computing

Pupils are encouraged to use calculators and other electronical devices, gaining confidence throughout their school experience.

ICT will be used to enhance pupils' maths skills through the use of online resources and the creation of spreadsheets. ICT will also be used to record findings, using text, data and tables.

Teaching and learning

Implementation

A unit of work typically incorporates the following:

- We currently use the White Rose Maths scheme which follows the National Curriculum Programmes of Study for long term and medium term planning.
- The scheme is divided into small-steps which progress throughout the school and is used for long term, medium term, weekly and daily lessons.
- At the start of a block of learning, pupils complete a cold assessment to identify current knowledge and the next steps for learning. This is repeated at the end of a block to assess the knowledge gained and any gaps the pupils may still have.
- Targeted questioning is used at the start of each lesson to retrieve previous learning and identify current knowledge and any gaps or misconceptions.
- Working Walls are used to reflect the unit of work that is being taught and demonstrate the build-up of skills throughout the unit incorporating any key vocabulary taught. These are referred to regularly throughout lessons to encourage and promote independence.
- Vocabulary- a wide range of mathematical vocabulary to be modelled and displayed on the working wall and used in context to demonstrate understanding.
- Teach the C-P-A-R model: a concrete, pictorial, abstract and reasoning approach is used to encourage children to make links between practical equipment, pictures and abstract numbers whilst learning new ideas and building on their existing knowledge to explore abstract concepts in a more familiar and tangible way.
- Application-varied fluency, reasoning and problem solving are used to develop a deep and secure knowledge and understanding of mathematical concepts.
- Assess- through live marking, formative and summative assessment (prior learning and end of unit assessments) as well as through questioning, feedback and plenaries.

Daily Maths Teaching:

- Pupils complete challenge maths arithmetic questions to continue to practise previously taught concepts.
- Careful consideration is given to retrieving and applying previous knowledge and identifying gaps and misconceptions through targeted questioning and quizzes. The lesson will start with a warm up or retrieval exercise.
- New vocabulary is shared and placed on the working wall to be referred to throughout the lesson.
- New concepts are taught with a focus on applying the C-P-A-R approach to ensure pupils master the small steps.
- Pupils apply learning to independent tasks, making use of concrete resources to support their learning.
- Live marking and feedback is used throughout the lesson to ensure pupils know how well they are securing new concepts and to address any misconceptions that may arise.
- Pupils have the opportunity to apply any new learning to enable them to reason and solve mathematical problems.

Homework:

Homework will be set on a weekly basis and will support pupils' arithmetic skills. Pupils will also be expected to access Times Tables Rockstars at least three times a week. Homework will take a variety of formats, including mental maths tasks, games, data analysis activities and written tasks.

Assessment and reporting

Pupils will be assessed and their progression recorded in line with the school's Primary Assessment Policy.

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.

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

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'.

Throughout the year, teachers will plan on-going creative assessment opportunities in order to gauge whether pupils have achieved the key learning objectives.

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

- Classroom tests and formal exams

Formative assessment, which is carried out informally throughout the year, enables teachers to identify pupils' understanding of subjects and inform their immediate lesson planning.

In terms of summative assessments, 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.

Standardised tests will be used termly 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.

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 will be monitored by the SENCO.

Resources

The maths lead is responsible for the management and maintenance of maths resources, as well as for liaising with the Principal in order to purchase further resources.

Maths resources will be stored in the maths cupboard and the classroom, including calculators, rules and protractors.

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

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

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

Equal opportunities

In accordance with the school's Equality Information and Objectives Policy, all pupils will have equal access to the maths curriculum.

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

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.

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

The school aims to provide academically more 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.

Monitoring and review

This policy will be reviewed on an annual basis by the maths lead.

The maths lead will monitor teaching and learning in the subject at St Thomas', ensuring that the content of the national curriculum is covered across all phases of pupils' education.

A named member of the governing body is briefed to oversee the teaching of numeracy, and meets regularly with the subject leader to review progress.

Approved and signed off by:

Principal: Louise Fry

Chair of Governors: