Rational

Mathematics 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 in most forms of employment. A high-quality mathematics education, therefore, provides a foundation for understanding the world, the ability to reason mathematically and a sense of enjoyment and curiosity about the subject.

Aim(s):

We aim to develop lively, enquiring minds encouraging pupils to become self-motivated, confident and capable in order to solve problems that will become an integral part of their future. The National Curriculum for mathematics aims to ensure that all pupils:

- Become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems

- Can **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.

At St Peter and St Paul's, we believe that:

- Children deserve to be set appropriate challenges and tasks that cater to their needs and give them the opportunity to learn and develop in a stimulating and pressure-free environment
- To be taught well and be given the opportunity to learn in ways that maximise the chances of success
- To be supported by adults, in the classroom or in interventions, to address particular barriers to progress that they face

Outcomes:

At St Peter and St Paul's, we aim to sustain and develop in all children:

- Confidence, understanding and enjoyment in Mathematics
- Awareness of relationship and pattern, and how these can bring about a clearer understanding of a situation
- An appreciation of Mathematics as a means of communication and analysis
- The ability to work systematically where the task requires a careful, accurate approach, as well as the ability to apply imagination, initiative, ingenuity and flexibility
- Independence of thought and action as well as the ability to cooperate in a group
- Problem solving skills and strategies
- The ability to apply Mathematics across the broader curriculum and beyond
- Sensible use of factual recall, mental and written strategies, calculations, micro-technology and other mathematical aids

School Curriculum: Programme of Study

Mastery Approach

In September 2021, St Peter and St Paul's began transitioning towards a mastery approach to the teaching and learning of mathematics. We understood that this would be a gradual process and take several years to embed. The rationale behind changing our approach to

teaching mathematics lay within the NCETM Maths Hub Programme as well as the 2014 National Curriculum, which states:

• The expectation is that most pupils will move through the programmes of study at broadly the same pace.

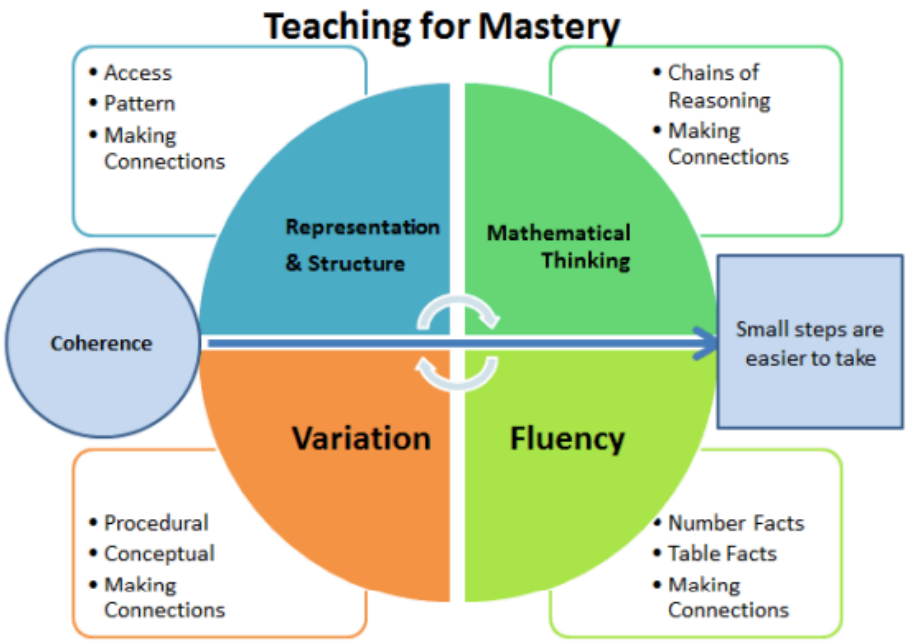
• Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content.

• Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

FLUENCY – REASONING – PROBLEM SOLVING

These three key aims of the National Curriculum should be addressed in each sequence of learning.

Five Big Ideas for Teaching for Mastery (NCETM 2017)



We use the mastery approach to teaching, which centres around the NCETM's 'Five Big Ideas':

Coherence

Teaching is designed to enable a coherent learning progression through the curriculum, providing access for all pupils to develop a deep and connected understanding of mathematics that they can apply in a range of contexts.

Representation and Structure

Teachers carefully select representations of mathematics to expose mathematical structure. The intention is to support pupils in 'seeing' the mathematics, rather than using the representation as a tool to 'do' the mathematics. These representations become mental images that students can use to think about mathematics, supporting them to achieve a deep understanding of mathematical structures and connections.

Mathematical Thinking

Mathematical thinking is central to how pupils learn mathematics and includes looking for patterns and relationships, making connections, conjecturing, reasoning, and generalising. Pupils should actively engage in mathematical thinking in all lessons, communicating their ideas using precise mathematical language.

Fluency

Efficient, accurate recall of key number facts and procedures is essential for fluency, freeing pupils' minds to think deeply about concepts and problems, but fluency demands more than this. It requires pupils to have the flexibility to move between different contexts and representations of mathematics, to recognise relationships and make connections, and to choose appropriate methods and strategies to solve problems.

Variation

The purpose of variation is to draw closer attention to a key feature of a mathematical concept or structure through varying some elements while keeping others constant.

- Conceptual variation involves varying how a concept is represented to draw attention to critical features. Often more than one representation is required to look at the concept from different perspectives and gain comprehensive knowledge.
- Procedural variation considers how the student will 'proceed' through a learning sequence. Purposeful changes are made in order that pupils' attention is drawn to key features of the mathematics, scaffolding students' thinking to enable them to reason logically and make connections.

Teachers draw from a wide range of teaching resources, including the NCETM Master Resources, White Rose and NRich. Pupils are also given bespoke resources, targeted at their areas for development, to ensure that their individual needs are being met.

Early Years Foundation Stage:

The programme of study for Foundation stage is set out in the EYFS framework (2014). This is applied in the classroom through a broad and engaging range of activities that encourage

hands-on, active learning, through which pupils are able to manipulate concrete tools, form and notice patterns and structures, continue to build an understanding of number and counting, and engage with shapes, spaces and measure, both in and out of context.

Key Stage 1:

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 (e.g. 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.

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.

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.

Cross Curricular

Throughout the whole curriculum, opportunities to extend and promote Mathematics should be sought. Within every Science topic, children will also develop their mathematical skills. This will help children appreciate how to Work Scientifically but also practise discrete mathematical skills. Nevertheless the prime focus should be on ensuring mathematical progress delivered discretely or otherwise.

Teaching and Learning

The approach to the teaching of mathematics within the school is based on:- • A mathematics lesson every day • A clear focus on direct, instructional teaching and interactive oral work with both the whole class and smaller ability groups. The curriculum is delivered by class teachers. All work is differentiated in order to give appropriate levels of work and children are taught in ability groups from the end of Year 2. There is one form entry with each class teacher taking responsibility for their year. Planning is based upon the National Curriculum (2014). Programmes of Study should inform medium term plans and subsequently weekly planning. Class teachers are responsible for the relevant provision of their own classes

Calculation Policy

The calculation policy (see calculations/progression policy) has been updated in light of the new national curriculum programmes of study and discussion with class teachers.

Inclusion and equal opportunities

All children are provided with equal access to the mathematics curriculum. We aim to provide suitable learning opportunities regardless of gender, ethnicity or home background.

Entitlement

St Peter and St Paul's, we teach mathematics to all children, whatever their ability or individual need. Through our mathematics teaching, we provide learning opportunities that enable all pupils to make good progress. Every child has an equal right to receive the maths curriculum in daily maths lessons of approximately one hour. There may be times when it is more appropriate for Foundation Stage or Key Stage 1 sessions to be approximately 45 minutes in length and for Key Stage 2 sessions to be over an hour.

Special Educational Needs

All children will have their specific needs met through differentiated work in conjunction with targets. TA support time is planned for and provided in relation to identified needs for individuals and groups.

Displays

Each classroom / resource area should have a maths display relating to current work. The maths display should be presented to the pupils as a 'maths working wall' in classrooms from Reception to Year 6 and as a 'maths area' for children in Nursery, accessing our larger Early Years space. Displays should be accessible to both teaching staff and the pupils and should be updated regularly to reflect pace of learning. All teaching staff follow a list of 'non-negotiables' to inform them of what should be included on their 'working walls' to ensure that they are useful, purposeful and effective in promoting children's independence and progress in the subject. This list includes key vocabulary, resources and the four operations, (after they are known to the children), current learning objectives, (that should be updated at least weekly), examples of methods and calculations, higher order questions, challenges, examples of the children's work and interactive opportunities.

Assessment

Assessment tools that are used are as follows:

- Insight Tracking to record progress across the academic year
- NFER testing to supplement teacher judgement
- Formative marking and verbal feedback
- Informal quizzes/testing, including weekly arithmetic tests from Year 4-6
- SATS – Year 2/6

Marking and Presentation

Teachers are expected to adhere to the schools marking policy when marking books and presentation policy when guiding children as to how to present their work. Highlighters are used to mark the objective (green and pink).

Monitoring and Evaluation

The Curriculum leaders, alongside SLT, are responsible for monitoring and evaluating curriculum progress. This is done through book scrutiny, planning scrutiny, lesson observations, pupil interviews, staff discussions and audit of resources.

Review

The Mathematics policy will be reflected in practise across the whole school, and will be reviewed in September 2023 by the Senior Leadership Team and the Mathematics Coordinator.