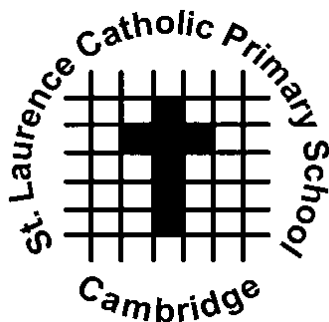


*Through God's grace a community growing in knowledge and understanding*



# St. Laurence Catholic Primary School

## Maths Policy



## **St Laurence Catholic Primary School Mathematics Policy**

### **Introduction**

In September 2017, St Laurence Catholic Primary School 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 National Centre for Excellence in Teaching of Mathematics (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.

### **Purpose**

The purpose of this policy is to describe our practice in Mathematics and the principles upon which this is based.

### **Aim(s)**

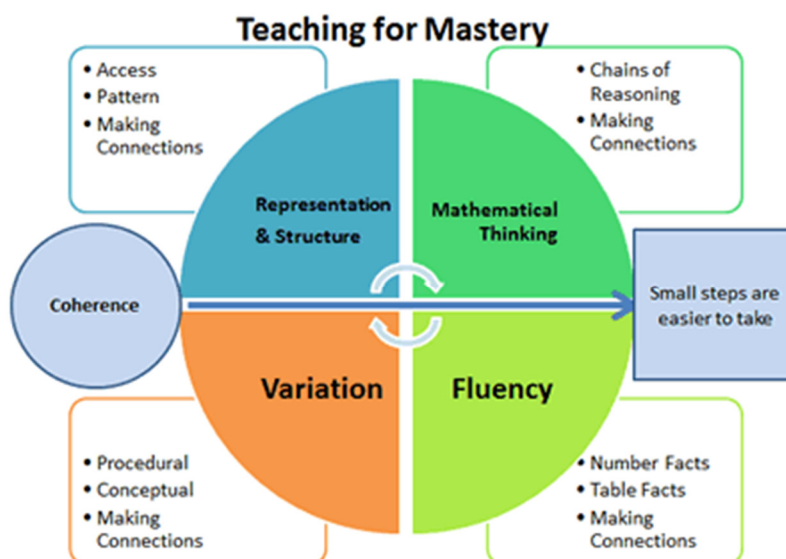
We aim to develop lively, enquiring minds encouraging pupils to become self-motivated, confident and capable in order to solve problems that will become an integral part of their future.

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
- **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.

## **Teaching for mastery -What does mastering maths mean?**

Mastery in maths means acquiring a deep, secure and adaptable understanding of the subject. Central to the development of mastery in our classrooms, here, at St Laurence are the “five big ideas”- these have been drawn from research evidence, underpinning teaching for mastery. This diagram is used to help bind these ideas together.



We recognise that a clear understanding of these ideas will only come after professional dialogue between teachers. Together staff explore how these concepts are reflected in day-to-day maths teaching.

The staff at St Laurence have worked closely with the Cambridge Maths Hub. Through this partnership we have attended training; become members of research work groups; attended lead professional development courses; planned and delivered staff training and studied the delivery of maths during our lesson study sessions within school. We have a continually growing and developing understanding of mastery and how best to develop our own maths practice (individually and as a school).

### **The Five Big Ideas**

#### **Coherence**

Connecting new ideas to concepts that have already been understood, and ensuring that, once understood and mastered, new ideas are used again in next steps of learning- all steps being small steps.

#### **Representation and Structure**

Representations used in lessons expose the mathematical structure being taught. These representations are practical and pictorial models. The aim being that students can do the maths without recourse to the representation.

#### **Mathematical Thinking**

If maths concepts are to be understood deeply, they must not merely be passively received but must be worked on by the student: thought about, reasoned with and discussed with others.

#### **Fluency**

Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics. Procedural fluency is the ability to apply procedures accurately, efficiently, and flexibly; to transfer procedures to different problems and contexts; to build or modify procedures from other procedures; and to recognise when one strategy or procedure is more appropriate

to apply than another.

### **Variation**

Varying the way a concept is initially presented to students, by giving examples that display a concept as well as those that don't display it. Also, carefully varying practice questions so that mechanical repetition is avoided, and thinking is encouraged.

### **The Essence of Maths Teaching for Mastery**

- Maths teaching for mastery rejects the idea that a large proportion of people 'just can't do maths'.
- All pupils are encouraged by the belief that by working hard at maths they can succeed.
- Pupils are taught through whole-class interactive teaching, where the focus is on all pupils working together on the same lesson content at the same time, as happens in Shanghai and several other regions that teach maths successfully. This ensures that all can master concepts before moving to the next part of the curriculum sequence, allowing no pupil to be left behind.
- If a pupil fails to grasp a concept or procedure, this is identified quickly and early intervention ensures the pupil is ready to move forward with the whole class in the next lesson.
- Lesson design identifies the new mathematics that is to be taught, the key points, the difficult points and a carefully sequenced journey through the learning. In a typical lesson pupils sit facing the teacher and the teacher leads back and forth interaction, including questioning, short tasks, explanation, demonstration, and discussion.
- Procedural fluency and conceptual understanding are developed in tandem because each supports the development of the other.
- It is recognised that practice is a vital part of learning, but the practice used is intelligent practice that both reinforces pupils' procedural fluency and develops their conceptual understanding.
- Significant time is spent developing deep knowledge of the key ideas that are needed to underpin future learning. The structure and connections within the mathematics are emphasised, so that pupils develop deep learning that can be sustained.
- Key facts such as multiplication tables and addition facts within 10 are learnt to automaticity to avoid cognitive overload in the working memory and enable pupils to focus on new concepts.

### **Organisation and Environment**

From EYFS through to Year 6 children are taught using the Power Maths scheme of learning in order to develop a coherent and comprehensive conceptual pathway throughout their primary education. Power Maths has been developed with White Rose Maths, it is a whole-class mastery programme that is aligned with White Rose Maths. This has ensured that parents can access home learning that follows a very similar sequencing and resourcing as Power Maths.

Power Maths for KS1 and KS2 are recommended by the DfE, having met the NCETM criteria for high-quality textbooks, and have been judged as "fully delivering a mastery approach". Our Power Maths annual subscription provides high quality online teaching resources as well as each child having their own termly practice book. In addition each child has their own maths journal to ensure that they have opportunities to explore their learning through their own explorative practice. This is a vital part of learning, the practice both reinforces pupils' procedural fluency and develops their conceptual understanding.

- Each lesson is broken down into small, connected steps, building from what pupils already know.
- Difficult points and potential misconceptions are identified in advance and strategies to address them

planned.

- Key questions are planned, to challenge thinking and develop learning for all pupils.
- Contexts and representations are carefully chosen to develop reasoning skills and to help pupils link concrete ideas to abstract mathematical concepts.
- The use of high quality materials and tasks to support learning and provide access to the mathematics, is integrated into lessons. As well as the Power Maths resources these include White Rose Maths Schemes of Learning and Assessment Materials, NCETM Mastery Assessment materials, NRICH and other pictorial representations and concrete resources.
- Opportunities for extra fluency practice (instant recall of key facts, such as number bonds, times tables, division facts, addition and subtraction facts) are provided alongside our maths lessons (e.g. morning starters, homework activities).

### **Lesson Structure**

- Lessons are sharply focused; digression is generally avoided.
- Key new learning points are identified explicitly.
- There is regular interchange between concrete/contextual ideas, pictorial representations and their abstract/symbolic representation.
- Mathematical generalisations are emphasised as they emerge from underlying mathematics, which is thoroughly explored within contexts that make sense to pupils.
- Making comparisons is an important feature of developing deep knowledge. The questions “What’s the same, what’s different?” are often used to draw attention to essential features of concepts.
- Repetition of key ideas (for example, in the form of whole class recitation, repeating to talk partners etc.) is used frequently. This helps to verbalise and embed mathematical ideas and provides pupils with a shared language to think about and communicate mathematics.
- Teacher-led discussion is interspersed with short tasks involving pupil to pupil discussion and completion of short activities.
- Formative assessment is carried out throughout the lesson; the teacher regularly checks pupils’ knowledge and understanding and adjusts the lesson accordingly.
- Gaps in pupils’ knowledge and understanding are identified early by in-class questioning. They are addressed rapidly through individual or small group intervention, either on the same day or the next day, which may be separate from the main mathematics lesson, to ensure all pupils are ready for the next lesson.
- Teachers discuss their mathematics teaching regularly with colleagues, sharing teaching ideas and classroom experiences in detail and working together to improve their practice.

### **Marking**

Next step marking will not always be necessary as the next lesson is normally the next step in learning. However, it is essential that all marking picks up and addresses any misconceptions/mistakes. Quick interventions ensure children have time to clarify their thinking and

remain on target. Children respond to errors or next steps using a purple pen or pencil. Verbal feedback and five minutes interventions can have the greatest impact. VF (verbal feedback) marked in the book indicates that this has taken place.

All teachers will give pupils regular, positive feedback. When marking work, encouragement and support is given to each child in addition to clear guidance on how to improve using next step marking. Our positive marking policy includes giving verbal praise, team points and stars. Correct answers should be ticked. Incorrect answers should be marked with a dot. In EYFS and Year 1 children should be encouraged to use a number line to check number formation. By Year 2 most children are able to form their numbers correctly and support is given to those still needing help.

As children progress into Key Stage 2 they should, with increasing detail, show the stages of their thinking, particularly with problem exercises, completing corrections when required and sometimes marking their own work or that of a partner. The teacher's judgement should be used regarding the siting of corrections, i.e. beside the wrong answer or in the child's maths journal.

Not all wrong sums need to be corrected, depending on the nature of the error, i.e. one digit wrong in a sequence of otherwise correct answers. In this case the teacher may simply circle the incorrect digit in the answer.

## **Assessment**

### **Assessment and Data Recording of Attainment and Progress**

In addition to the formative assessment undertaken in lessons, teachers will use termly summative assessments White Rose Maths to reinforce their judgements and provide further opportunities to identify gaps in pupil learning and tailor future lessons. Teacher judgements are then entered onto the school assessment tracking program (Target Tracker) each term and teachers talk through the progress of their pupils at half termly pupil progress meetings; this ensures targeted and timely support can be given to those who need it. We use these judgements to assess progress and achievement against individual, school and national targets. We identify and target those children not making expected progress and intervene accordingly.

Teachers in Year 2 and Year 6 will also use the statutory End of Key Stage National Curriculum tasks and tests (as directed in the Assessment and Reporting Arrangements booklet) as one part of the assessment picture for each child. Teachers in Year 4 will administer the Multiplication Times Table Check, which is a key stage 2 (KS2) assessment to be taken by pupils at the end of year 4.

In the autumn and spring terms we give parents the opportunity to discuss their child's progress and attainment in a teacher/parent consultation. In the summer term we write a summary of each child's progress and achievement in the Annual Report for parents.

Targeted support includes Pixl Therapy sessions to support children with similar misconceptions as well as a range of individual and other group interventions for children with specific needs.

All assessment and tracking information is passed on to the next teacher at the end of the year, so that they can plan for the new school year.

## **School Curriculum**

The school's calculation policies (2021) have been created to provide continuity in teaching across the phases which in turn will facilitate measured progress for children in school.

## **Early Years Foundation Stage (EYFS)**

Mathematics within the EYFS is developed through purposeful, play based experiences using the indoor and outdoor provision. Learning is based on pupil's interests and current themes whilst focusing on the expectations from the EYFS Statutory Framework and the Development Matters non-statutory guidance.

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

Teaching for Mastery in EYFS is supported by the structure of the Power Maths teaching sequence and children's individual journals. Power Maths combines short, ten-minute bursts of maths teaching each day with plenty of practice through both guided activities and independent play helping to ensure a smooth transition to KS1, and a consistent approach across our whole school from Reception to Year 6.

## **Key Stage 1**

The principal focus of mathematics teaching in Key Stage 1 is to ensure pupils develop confidence and mental fluency. The essential idea behind the mastery approach is that all children have a deep understanding so that future learning continues to build on solid foundations. If the subject is represented using concrete materials, pictorial representations and abstract symbols, it will allow children to visualise maths in varied ways, see connections and to independently explore and investigate a topic. Practical activities and resources offer the children a deeper mathematical understanding of more complex concepts. Providing children with visual representations also offers a scaffold when developing a more robust understanding of maths. Throughout Key Stage 1, it is important that children gain a secure knowledge of number and place value and become confident when using the four operations in both formal methods as well as problem solving where often the approach is not immediately evident. Alongside number work, pupils begin to identify fractions using shapes, objects and quantities and make connections to equal sharing and grouping. Pupils are taught to count to ten in fractions, recognise equivalent fractions and develop their understanding of fractions on a number line. At this stage, pupils will also develop their ability to recognise, describe, draw, compare and sort different shapes. Pupils have the opportunity to use a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money and are expected to use related vocabulary for all topics. Other subjects may have strong links to some maths topics allowing cross-curricular teaching. For example, shape through art or computing, measures through science or coordinates in geography. This is to ensure we continually maximise learning opportunities for all pupils across our entire curriculum.

## **Key Stage 2**

**Lower Key Stage 2 – Years 3-4.** 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 will ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, pupils develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching will also ensure that pupils draw with progressive accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. Children can use measuring instruments with increasing 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.

**Upper Key Stage 2 – Years 5-6** 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 will develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio. At this stage, pupils also 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 consolidates and extends knowledge developed in number. Teaching also ensures 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.

### **Inclusion and Special Needs**

St Laurence Catholic Primary aims to meet the needs of all, taking into account gender, ethnicity, culture, religion, language, disability, age and social circumstances. The provision for children with special needs is detailed in the SEND Policy.

Teaching maths for mastery offers all pupils access to the full maths curriculum. This inclusive approach, and its emphasis on promoting multiple methods of solving a problem, builds self-confidence and resilience in pupils. Though the whole class goes through the same content at the same pace, there is still plenty of opportunity for differentiation. Taking a mastery approach, differentiation occurs in the support and intervention provided to different pupils, not in the topics taught, particularly at earlier stages. There is no differentiation in content taught, but the questioning and scaffolding individual pupils receive in class as they work through problems will differ. Those pupils who have grasped a specific concept quickly are challenged through more demanding problems which deepen their knowledge of the same content. Those children who are not sufficiently fluent are provided additional support to consolidate their understanding before moving on. Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with intervention.

We have high expectations of all children and strongly believe that all children are able to achieve in mathematics. Some may take longer to grasp a concept and may need careful scaffolding or extra time or support for one or more topics.

### **Links with other curriculum areas**

Throughout the whole curriculum, opportunities to extend and promote maths should be sought. The structure and connections within maths are emphasised, so that pupils develop deep learning that can be sustained.



## **Spiritual, moral, social and cultural development**

The teaching of mathematics supports the social development of our children through the way we expect them to work with each other in lessons. We group children so that they work together, provide opportunities and structure for collaborative learning, and we give them the chance to discuss their ideas and results.

## **Home/School Link**

Guidance and information about our maths teaching and learning is provided on the school website, along with links to Microsoft Teams, Power Maths School Jam and other useful apps, games and maths websites. Homework will be sent home when appropriate in order to reinforce concepts and skills being learned in school.

At St Laurence we encourage parents to be involved in the mathematics curriculum by:

- Providing parents with information outlining what mastery teaching involves in EYFS and KS1 & KS2 and how they can support their child at home.
- Running teaching for mastery curriculum evenings and workshops.
- Meeting parents twice a year for parents' consultations to discuss their child's progress.
- Reporting on mathematical progress in their child's end of year report as well as at parent consultations in the Autumn and Spring terms.
- Publish the school's Calculation policy for each phase on the school website.

## **Role of the Subject Leader**

The Maths Curriculum Leader:

- Ensures teachers understand the requirements of the National Curriculum and supports them to plan lessons. Leads by example by setting high standards in their own teaching. In addition offers informal support, advice and feedback opportunities to colleagues throughout the school year.
- Leads continuing professional development; facilitates joint professional development – including lesson studies; provides coaching and feedback for teachers to improve pupil outcomes.
- Leads the whole-school monitoring and evaluation of teaching and learning in mathematics by observing teaching and learning in mathematics regularly; analysing assessment data in order to plan whole school improvement in mathematics; conducting work scrutiny to inform evaluation of progress; conducting pupil interviews.
- Takes responsibility for managing own professional development by participating in external training, independent private study, engaging in educational research and scholarly reading and keeping up-to-date with Teaching for Mastery developments.
- Keeps parents informed about changes in the mathematics curriculum and assessments.
- Ensures that the school's senior leaders and governors are kept informed about the quality of teaching and learning in mathematics.
- Works in close partnership with the school's senior leaders to ensure the learning needs of all pupils

in mathematics are met effectively.

- Keeps the school's policy for mathematics under regular review.

### **Conclusion**

As a core subject maths will continue to be central to learning in school. We will regularly evaluate and improve our practice in maths teaching and learning in order to prepare St Laurence children for end of Key Stage SATs, progression to secondary education, and for the use of maths in adult life.

### **Review**

Policy discussed and agreed with LGB 22nd April 2021

Next review by Governors Spring term 2024

