

# Our Lady Star of the Sea Catholic Primary School

## Mastery in Mathematics Policy

Mission Statements *“You are precious in my eyes”-Isaiah 43*

- *Our Lady Star of the Sea Catholic Primary School is committed to the widest and fullest education of all pupils in partnership between home, school, parish and community.*
- *Our school aims to create a happy, ordered environment where all members feel secure, valued and respect each other.*
- *Our school aims to be a positive force within the Catholic church inspired by the life of Christ in the Gospels.*

### INTENT

Mathematics is a tool for everyday life. It is a whole network of concepts and relationships which provide a way of viewing and making sense of the world. It is used to analyse and communicate information and ideas and to tackle a range of practical tasks and real life problems. It also provides the materials and means for creating new imaginative worlds to explore.

Using the programmes of study from the National Curriculum 2014 and a mastery approach it is our aim to develop:

- A positive attitude towards mathematics and an awareness of the fascination of mathematics.
- Competence and confidence in mathematical knowledge, concepts and skills.
- An ability to solve problems, to reason, to think logically and to work systematically and accurately.
- A desire to use ones initiative and an ability to work both independently and in cooperation with others.
- An ability to communicate mathematics.
- An ability to use and apply mathematics across the curriculum and in real life.
- An understanding of mathematics through a process of enquiry and experimentation.

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

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



Here at Our Lady’s we recognise that a clear understanding of these ideas will only come from professional dialogue between teachers. Together staff explore how these concepts are reflected in day-to-day maths teaching. The school has transitioned to a mastery approach when teaching maths. This transition has taken place since 2016 through training, lesson study, performance management and continual professional dialogue.

The “5 big ideas” broken down:

**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 use the representations to explain the maths and then 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. There is a “ping pong” style to the teaching - all children fully participating all the time.

**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. Phrases such as: True or false? What's the same? What's different? Always true, sometimes true never true. Are continually used.

## **IMPLEMENTATION**

### **Teaching for Mastery Principles:**

- Teaching is underpinned by a belief in the importance of mathematics and that the vast majority of children can succeed in learning mathematics in line with national expectations for the end of each key stage.
- The whole class is taught mathematics together, with no differentiation by acceleration to new content. The learning needs of individual pupils are addressed through careful small step scaffolding, skilful questioning and appropriate intervention is given in order to provide the necessary support and challenge.
- Factual knowledge (e.g. number bonds and timetables), procedural knowledge (e.g. formal written methods) and conceptual knowledge (e.g. place value) are taught in a fully integrated way and are **all** seen as important elements in the learning of mathematics.
- The reasoning behind mathematical processes is emphasised. Teacher/pupil interaction explores in detail **how** answers were obtained, **why** the method/strategy worked and what might be the most efficient method/strategy.
- Interim methods (e.g. expanded methods for addition and subtraction) to support the development of formal written algorithms are used for a short period of time only, as a stepping stone into efficient and compact methods.

- Precise mathematical language coached in sentences (stem sentences) is used by the teacher so mathematical ideas are conveyed with clarity and precision.
- Conceptual variation and procedural variation are used. These provide intelligent practice that embeds deep learning.
- Sufficient time is spent on key concepts to ensure learning is well developed and deeply embedded before moving on.

## Curriculum Design

- Programmes of study follow *the NC Ready to Progress documents*. The teacher carefully sequences concepts seeking to develop a coherent and comprehensive conceptual pathway.
- Learning is broken down into small steps, connected steps building on from what pupils already know. There is little repetition of previous learning (year before). The focus is on delivering deep understanding of concepts within the year groups expectation.
- Difficult points and potential misconceptions are identified in advance (during the planning stage- staff talk openly and seek support from one another and the maths lead). Teachers plan to address misconceptions– this is often a fluid process. Alongside this, deep consideration is given to key questions– these are designed 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. These include the part whole model (cherry diagram) and the bar model.
- CPA (concrete-practical-abstract) model is used throughout school from foundation to Year 6. Practical apparatus is used to support conceptual understanding. Alongside this equipment the teachers select high quality materials to support tasks or devise their own using mastery materials.

## Features of teaching

- Lessons are sharply focused; digression is generally avoided. New key learning is explicitly identified.
- 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 the contexts that make sense to the pupils. The questions “Is it always true?” “Sometimes true?” “Never true?” are used to explore these moments.
- Making comparisons is an important feature of developing deep knowledge. The questions “What’s the same?” and “What’s different?” are often used to draw attention to essential features in a concept.
- Repetition of key ideas (e.g. in the form of whole class recitation, repeating to a learning partner 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 are identified and rapidly addressed. This may involve intervention work in school or with parents or some extra support at a different time.

- Teachers discuss their mathematics teaching regularly with colleagues, sharing teaching ideas and classroom experiences in detail and working together to improve practice.
- Children document their learning in their maths journals. Reflections can be included and new definitions expressed here to refer to later. Corrections and errors are responded to with a purple pen.
- Guided practice is used through which the children experience a new concept (with adult or peer) before moving on to independent tasks.
- Problems are discussed deeply and structured by the teacher, using the children's methods when possible, to investigate different ways to solve it. Children evaluate the methods themselves. The key question "What do I already know?" is used throughout the school.
- Children should be able to apply their understanding to independent tasks once fluency is achieved.

## Marking

Next step marking is rarely 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 intervention is required ensuring children have time to clarify their thinking and remain on target. Children respond to errors using a purple pen. Oral feedback and intervention of 5 mins can have the greatest impact. OF (oral feedback) marked in the book indicates that this has taken place in relation to a misunderstanding. Children mark alongside the teacher as the back and forward model in mastery allows. There is a point in lessons when independent "intelligent practice" takes place—marking this work can be very valuable. Responses here will help inform the next steps in learning. Marking in green, corrections in purple.

## Exercise books for recording

It is school policy that the following is used:

Year1/2/3: 1cm squares

Year 3 is in transition and move towards the using of 7mm squares

KS2: 7mm squares.

Children place the date in numerals in the left hand corner of the page or below the last ruled off piece of work. eg. 2/9/19. KS2 children place a title which identifies the specific learning intention eg. Can I use partitioning when adding (if this is inappropriate for any individual the teacher uses their judgement.) Both the title and date are underlined with a ruler and pencil. All work done in maths is done in pencil, rubbers are discouraged when completing number work, children should cross out work with one or two straight lines, allowing the teacher to analyse the errors when marking. Rubbers are appropriate when working on shape/ space work.

## **Assessment and Record Keeping**

AFL is ongoing through class interactions and evidence from the children's books. In response daily alterations to plans (smart screens) is part of practice. At the end of each unit (see class maths overviews) the teach sets short end of unit assessments. This is marked and the children's level of attainment is recorded on individual class maths trackers. Here it is evident which children are working below expectation and require intervention or further support.

**Developing**

**Expected**

**Greater depth**

## **Moderation**

Moderation is a crucial part of teacher assessment. A child is judged on the work in their maths books and assessments, The staff come together termly to moderate the children's work. Specific or random children are selected and their books scrutinised by fellow colleagues, this allows the teacher to share the understanding of the child and their current level of attainment. This process also allows the staff to come together to evaluate the quality and level of attainment both below and above their year group. High expectations and excellent practice shared. The Maths Lead will also take the opportunity to watch lessons, interview children and track the planning of maths on the schools shared server. This gives an overall understanding of mathematical teaching and how much love the teachers and children have for the subject.

## **Pupils with Special Educational Needs (SEN)**

In line with our Learning and Teaching policy we recognise that all children have needs and we continuously strive to ensure that we challenge all children to reach their true potential. Teachers know their children and strive to move their learning on. Children who are on the Special Educational Needs (SEN) register will be working in line with their Individual Education Plan (IEP).

## **Information Communication Technology (ICT) within the maths curriculum**

ICT is a valuable tool used by teachers to enhance learning. All classrooms have CTouch Screens with internet access enabling teachers to use visual stimuli and display research materials. Various programs and the internet, including our school website are used by the children to investigate topics and develop understanding. These platforms are developed with children to ensure they can continue with work at home to support deeper learning in class.

## **Reporting**

A verbal report is given to parents at Parents' Evening in the autumn and spring terms.

Maths is a core subject curriculum and is formally reported on in the annual written report sent to parents during the summer term. On this report, teachers comment on the level of attainment and progress in line with the year group expectations

## **THE GOVERNING BODY**

The governors are reported to on an annual basis.

## **IMPACT**

There is a love of mathematics throughout the school. Children are motivated to learn and have a sense of achievement. This, in turn, gives individuals the confidence to speak mathematically and to work on problems independently, rationally and logically. Staff are well supported and have the means (resources) to do the job well. There is continual dialogue between staff which allows individuals and teams to better teach specific aspects of maths. Children are willing to be wrong and are able to reflect on errors and locate mistakes. Children are resilient, able to have many attempts at a problem before succeeding. The children are mentally fluent and procedurally fluent: able to manipulate numbers in their heads and find the right efficient strategy. There is a buzz when maths is being taught, children share thinking openly and are ready to learn from errors.

## **Evaluation and Review**

This policy was written in consultation with staff and has been approved by governors during autumn 2022. It is available for parents to read on the school website in the LEARN area. As a school we always welcome feedback and if changes are required before the next review date, consultation will take place.

It is the intention to review and evaluate this document every two years in line with the whole school policy and the school development plan. (Autumn 2024)