St Augustine's Catholic Primary School

Be the Best You Can Be

Mathematics Policy

September 2021- September 2022

St. Augustine's Teaching and Learning Policy

This Policy should be read in conjunction with the Equal Opportunities Policy and Procedure (2020).

Aim

This policy is a statement of the aims, principles and strategies for teaching and learning at St. Augustine's Catholic Primary.

We have a mathematics policy so that all staff understand and achieve our shared standards of good practice. It is to provide an agreed framework for teaching mathematics within our school, in order to secure a coherent and continuous education for our children, to promote quality teaching, equality and inclusion.

Mathematics teaches children an awareness of the world around them through their ability to calculate, reason and solve problems. It enables children to understand relationships and patterns in both number and space in their everyday life.

At St. Augustine's we aim to ensure that every pupil:

1) Become **fluent** in the fundamentals of mathematics, including through varied and fluent practise with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
2) Can **reason** mathematically by following a line of enquiry, conjecturing relationships and generalisations, and develop an argument, justifications or proof using mathematical language.
3) 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 smaller steps and persevering in seeking solutions. (National Curriculum 2014)

Mathematics is an interconnected subject in which pupils need to move fluently between concepts and representations of ideas. At St. Augustine's we aim to provide as many opportunities for developing these skills as possible through our mastery curriculum and concrete, pictorial and abstract (CPA) approach. We also include children in the cycle of their learning through regular pupil-teacher discussions to correct any misconceptions and identify next steps in their learning.

Intent

At St. Augustine's Catholic Primary School, we are passionate about children's learning. The Cognitive Load research theory and Rosenshine's Principles of Instruction highlights that children learn through remembering and recalling and this theory is embedded this within the knowledge of our mathematics curriculum and consolidation mapping.

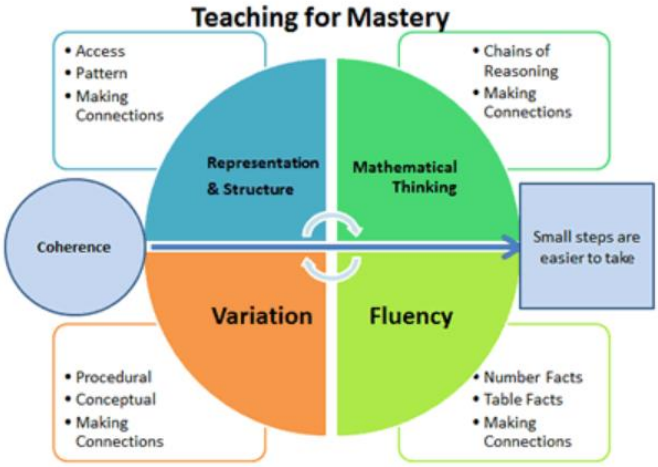
'Learning is Remembering and Recalling...'

St. Augustine's mathematics teaching provides inspiring and relevant learning opportunities for our children to develop the knowledge and skills that can be fluently applied across all subject areas. It ensures that all children's individual needs and experiences are developed through cross curricular application of mathematics within other subject areas in order to understand the importance of maths within the world around us.

Implementation:

Mastery

Our maths curriculum is planned and sequenced through small steps building on prior knowledge and understanding. Our planning follows the NCETM's mastery approach shown below:



Making connections lies the heart of our all our teaching for mathematical mastery. This includes within topic but also across different areas of the subject.

As you can see from the diagram above, coherence runs throughout the mastery model. To ensure teaching and learning is coherent, lessons are broke down into schemas that gradually unfold a concept, providing access for all children and leading to a generalisation of the concept and the ability to apply the concept to a range of contexts.

The four aspects of mastery are:

- **Representation and structure** – where all children are able to access new learning through scaffolding, modelling, pattern spotting and making connections by recalling prior schemas.
- **Mathematical Thinking** – where children are encouraged to use the correct mathematical knowledge and vocabulary and make connections between different mathematical concepts. If taught ideas 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** – where children recall prior knowledge with automaticity and apply to new knowledge and problem solving concepts. This includes fast and accurate recall of facts such as number bonds, times tables etc.
- **Variation** – Where teachers present new concepts in a variety of ways, making small variations to draw children's attention to specific mathematical relationships and structure. This will enable children to be independent and successful at understanding new concepts.

Quality First Teaching

At St. Augustine's we ensure that all of our children reach their full potential. One of the ways we do this is by ensuring that all our children are given Quality First Teaching. This means that our teaching emphasises high quality, inclusive methods and strategies which help all children to overcome any barriers to their learning and provides opportunities for challenge and curiosity.

Some of the ways we do this in mathematics are:

- Developing an enabling environment including our classrooms being well organised, accessible with well labelled resources.
- Ensuring that *lesson design* has a clear structure where children are made aware of the learning objective at the start of the lesson.
- The planning of learning is given in small steps and supported by manipulative resources, pictorial representations and then abstract representation (CPA approach).
- Explicitly teaching new vocabulary – often alongside the use of concrete or pictorial representations.
- Children are asked to represent their work in a variety of ways including showing a variety of different methods which are then shared and discussions about effective and efficient methods can take place.
- Children are taught different strategies to remember important information and are encouraged to use the ways that work for them e.g. highlighting, steps to success, pictorial representations, etc.
- Making explicit links to prior and future learning to make connections between different mathematical concepts.
- Children work in flexible groups - mixed, pairs and individually.
- Every teacher is a teacher of children with SEND and EAL children and receives training to ensure they are using the appropriate techniques and resources to support any children with additional needs.
- Use appropriate Rosenshine strategies such as modelling, scaffolding, effective questioning, use of key vocabulary, success criteria, independent/group work.
- Staff carefully track each child's progress to ensure that they are able to reach their full potential
- Staff meet regularly with parents and guardians to discuss their children's progress and keep them up to date with what their children are learning

Lesson Structure:

At St. Augustine's we are introducing Power Maths across the school to support with our teaching for mathematical mastery. For the academic year 2021-22, Reception, Year One and Year Three teachers will plan and deliver Power Maths, supporting Rosenshine's Principles and the mastery approaches.

The lesson structure is as follows:

- **Consolidation –** recalling arithmetic knowledge and number facts
- **Discover Task –** this promotes excitement and prompts children to find out more, encouraging them to think about what they can see (patterns, connections, number facts etc), what they need to know and do, discuss problem solving and share ideas.
- **Share –** designed to get children thinking about mathematical meaning rather than just abstract concepts. In this section, misconceptions are highlighted and explored, multiple

representations of problems are shared along with a variety of solutions, and children are encouraged to discuss using the correct mathematical vocabulary.

- **Think Together –** This is designed to support children to explore concepts and store them in their long-term memory, as memory is a product of what you think about. This section builds in small steps from the 'Discover' and 'Share' sections and is based around the I do, we do, you do method to build independence.
- **Independent Practise** – when children work through carefully designed questions that incorporate careful variation to practise the application of new mathematical knowledge.
- **Reflect** – a final plenary to reflect on what has been learnt, what methods and strategies were successful and how we can move learning forward in the next lesson.

Those classes not teaching Power Maths in the academic year 2021-22 will familiarise themselves with the Power Maths online resources, and use some of them within their planning and teaching, to begin introducing the model to the children. They will use a similar lesson structure based upon Rosenshine's Principles of Instruction and the mastery model.

The structure is as follows:

- **Consolidation –** recalling arithmetic knowledge and number facts
- **Reasoning Opportunity –** using discussion to explore a variety of solutions to problems explaining how/why and proving theories.
- **Sharing outcomes of components and composites** – a WAGBAT (we are getting better at) with specific reference to mathematical terminology and its meaning.
- **Modelling –** introducing strategies to support children's learning of certain concepts.
- **Questioning –** carefully differentiated questioning based on formative assessments and individual needs of the children.
- **Guided/shared/independent practise –** enabling the children to practise new concepts within a supportive framework, dependent on their needs, building to independent success.
- **Scaffolding –** providing the supportive mechanisms to all children to succeed and achieve lesson outcomes.
- **Success Criteria –** to enable children to understand the necessary steps to be independently successful.
- **Plenaries –** to enable children to reflect and recall new knowledge that has been taught throughout and where appropriate challenge them further with the next step.

Integral to our mastery approach is the correct use of mathematical vocabulary. Vocabulary is a reliable indicator of future academic and vocational success therefore we place emphasis upon this within the teachers' planning and direct teaching.

Impact

The impact of mathematics teaching is measured by the use of formative and summative assessments of the children's learning. These assessments are then used to inform future planning and supports the cohesion of our mathematics curriculum. This triangulates evidence, which enables teachers to track children's progress, to ensure that every child achieves their full potential.

The impact of successful mathematics teaching shows that:

- Children demonstrate a quick recall of facts and procedures. This includes the recollection of the times table.
- Children show confidence in believing that they will achieve.

- Each child achieves objectives (expected standard) for year group.
- The flexibility and fluidity to move between different contexts and representations of maths.
- The chance to develop the ability to recognise relationships and make connections in maths lessons.
- Mathematical concepts or skills are mastered when a child can show it in multiple ways, using the mathematical language to explain their ideas, and can independently apply the concept to new problems in unfamiliar situations.
- Children show a high level of pride in the presentation and understanding of the work