**Mathematics at St Augustine’s Catholic Primary School**



***“The only way to learn mathematics, is to do mathematics.”***

***Paul Haimos***

**Intent**

At St Augustine’s, we aim to equip all pupils with the skills and confidence **to solve a range of problems through fluency with numbers and mathematical reasoning**. Children are encouraged to see the mathematics that surround them every day and enjoy **developing vital life skills** in this subject. We strive to ensure that children will enjoy maths at St Augustine’s and that all children can be successful mathematicians. Our Mathematics Curriculum is rich and meaningful, based on a ‘Mastery’ approach which is accessible to all and will maximise the development of every child’s ability and academic achievement. We have high expectations of all children and strongly believe that all children can be successful mathematicians.

Mathematics is life-enriching and children will spend time becoming true masters of content, applying and being creative with new knowledge in multiple ways. We aim to teach for secure and deep understanding of mathematical concepts through manageable steps, ensuring children make rich connections across mathematical ideas.

We wish for our children to become fluent, efficient, competent mathematicians, who, by doing so, develop as resilient learners, understanding that misconceptions are a key part of their learning. We strive for our children to consistently use key mathematical vocabulary to reason and to develop into mathematical thinkers through solving increasingly sophisticated problems which will deepen their understanding of the mathematics. We intend for our pupils to be able to apply their mathematical knowledge to the wider curriculum in our school. As our pupils progress to their next stage of education, we wish for them to be able to understand the world, have the ability to reason mathematically, have an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

**Implementation**

**Fluency** – there is a whole school focus on developing an instant recall of key facts, such as number bonds, times tables, division facts, addition and subtraction facts. Fluency for all children is developed through daily basic skills lessons of Flashback Four and Power Up to support our children’s retrieval and to support them in knowing more and remembering more – this is taught separately to the main lesson. Additionally , EYFS, Year 1 and Year 2 engage in the **NCETM’s Mastering Number Programme** which is designed to strengthen the understanding of number and fluency with number facts.

**Power Maths** - From January 2022 all year groups (y1-6) were introduced to Power Maths, which is centred around the belief that all children can achieve. Power Maths is a whole class mastery approach to mathematics, which is aligned to White Rose Maths progressions and schemes of learning to deepen children’s understanding.

**Whole class together** - Power Maths is based around a whole-class interactive teaching model that supports learning for all by teaching concepts for longer to deepen learning and understanding. ***In line with NCETM advice, one form of depth frequently used, during the first part of the lesson***, ***is variation theory (conceptual and procedural). Variation is one of the five ‘big ideas’ at the heart of Teaching for Mastery. For example, a child who can produce a quick correct answer may be asked to solve the question using more than one other procedure, to represent the question in more than one way (such as the bar model or part whole).***

**Longer but deeper –** in order to ensure children have a secure and deep understanding of the content taught, our long and medium term plans, in line with Power Maths, allow longer on topics and we move more slowly through the curriculum. Power Maths has taken the National Curriculum and has broken it down into core concepts (units) and then divided into small steps (daily lessons). For each unit there is a quick check on prerequisite skills to enable pre-teaching to be delivered prior to reaching the lesson.

We use the Power Maths small steps planning and, after evaluating the findings of the National Textbook Project, ‘Power Maths’ textbooks and workbooks to support progression and variation. Teachers adapt each lesson to meet the needs of their children and add extra questioning / tasks which will allow children to learn the content more deeply. The learning will focus on one key conceptual idea and connections are made across mathematical topics.

**Key learning points** are identified during planning and a clear journey through the maths should be shown and reflected by each classroom’s working wall including key vocabulary. Learning points may appear to be very small but this is deliberate. For example, a whole lesson may be spent on adding the ones to a 3-digit number. The expectation is that every child will master the concept and some children will work more deeply on the same concept using variation theory and challenge tasks within their Mastery journals.

**Questions** will probe pupil understanding throughout, taking some children’s learning deeper. Responses are expected in full sentences, using precise **mathematical vocabulary,** which is discussed, displayed and modelled by the class teacher.

**Recording the** ***learning***– not just pages of similar calculations. Children complete their Power Maths workbooks which contains carefully crafted questions. If children need additional fluency, this will be created by the class teacher and documented in the Mastery Journal. Additionally, to this, some children then move on to their Mastery Journals following completion of their Power Maths books. Children use these to further deepen their understanding by exploring mathematical thinking and reasoning activities - those requiring written explanations of the children’s understanding, sometimes using pictorial representation, to help the child prove or explain and also challenging problem solving activities including open ended investigations. You will also find pictorial representation where appropriate documented in children’s Mastery Journals along with the key vocabulary for that unit.

**Practising** – not drill and practice but practice characterised by variation – years 1-6 Power Maths workbooks provide children with carefully chosen varied fluency questions and are essential in assessing how the children have understood the concept taught. Children’s understanding is then developed further to a greater depth through the use of Mastery Journals. During the lesson, the majority of the children will complete the pages independently however some children will need additional support to complete the pages. Further, children, namely our SEND children with Cognition and Learning as a Primary or Secondary Need, will sometimes be provided with different tasks and questions appropriate to their understanding of a concept and the correct curriculum stage at which they are working.

**CPA approach** - carefully chosen practical resources and pictorial representations are used to explore concepts. These pictorial representations will appear in children’s Mastery Journals as children show their understanding, rather than solely answers to a series of calculations. Children document their pictorial representation in their Mastery Journals where appropriate.

Develop **reasoning and deep understanding**  – problems are often set in real life contexts – reasoning is embedded throughout each lesson and not just at the end. Children who complete their Power Maths work will further deepen their understanding by completing mathematical thinking questions in their Mastery Journals

**Questions** to challenge thinking – teachers use high quality, effective questioning throughout every lesson to check understanding – a variety of questions are used, but you will hear the same ones being repeated: How do you know? Can you prove it? Are you sure? Can you represent it another way? What’s the value? What’s the same/different about? Can you explain that? What does your partner think? Can you imagine?

**Discussion and feedback** – pupils have opportunities to talk to their partners and explain/clarify their thinking at all stages during their lessons. Classrooms are rich in mathematical talk and language.

**Rapid intervention – in mathematics** new learning is built upon previous understanding, so in order for learning to progress and to keep the class together pupils need to be supported to keep up and areas of difficulty must be dealt with as and when they occur. Ideally this would happen on the same day but this is not always possible so it may be the following morning but will be before new learning is introduced.

Children in **EYFS** explore mathematical concepts through active exploration and their everyday play-based learning. Children are taught key concepts and application of number using a hands-on practical approach. EYFS practitioners provide opportunities for children to manipulate a variety of objects, which supports their understanding of quantity and number. The CPA approach is used when teaching children key mathematical skills. Practitioners allow children time for exploration and the use of concrete objects helps to support children's mathematical understanding. Maths in the early years provides children with a solid foundation that will enable them to develop skills as they progress through their schooling and ensures children are ready for the Nation Curriculum. White Rose and Mastering Number is utilised to support the children’s mathematical learning.

**What might a maths lesson look like?**

**The simple answer is no two lessons are the same. An example structure could be as follows…**

**Basic Skills Session**

All children in KS1 and KS2 have a discrete basic skills session following Flashback Four to support children in becoming fluent and support their retrieval of key number facts and basic skills with work documented in Basic Skills Books. KS1 use their Basic Skills Books to document their work when required – there will be lots of concrete work during these sessions. KS2 to document their work in their Basic Skills Book daily.

**Power Maths Session**

Power Maths sessions are broken down into: Power Up, Discover, Share, Think Together, Practice and Reflect.

1. **Power Up -** Each Power Maths lesson will start with a 5 minute Power Up activity which supports fluency in key number facts and reinforces key skills. This acts as a pre-teach for the lesson
2. **Discover**- the class are given a problem to solve, often a real-life example, sometimes a puzzle or a game to explore, which introduces the new learning. These are engaging and fun and designed to get all children thinking. It is usually completed in pairs with concrete materials as appropriate.
3. **Share**- the class shares their ideas and compares different ways to solve the problem, explaining their reasoning with concrete resources and pictorial representations to make their ideas clear. High quality mathematical talk, discussion and reasoning is embedded throughout.
4. **Thinking Together**- the next part of the lesson is a journey through the concept, delving deeper and deeper so that each child builds on secure foundations while being challenged to apply their understanding in different ways and with increasing independence. It follows the ‘I do, we do, you do’ structure, which gives the children opportunities to think together in their groups and also work independently.
5. **Practice**- now children practice individually, rehearsing and developing their skills to build fluency, understanding of the concept and confidence with thinking mathematically. The children are encouraged to use concrete materials and mathematical representations and structures to support their understanding as necessary.
6. **Reflect**- finally, children are prompted to reflect on and record their learning from each session and show how they have grasped the concept explored in the lesson.
7. When children have completed their Power Maths Workbook, children commence reasoning and problem-solving activities to deepen their understanding of the small step in their Mastery Journals.

**Impact**

Teachers mark children’s independent work daily so as to inform their planning for the subsequent days. This provides teachers with a greater understanding as to whether all children have grasped the small step which had been delivered that day. This then allows teachers the opportunity to reinforce learning where required the following day. Formative assessment is additionally ongoing during the lesson continually so as to evaluate learning at every stage, through the use of a variety of strategies including effective questioning, so as to check understanding and identify and address any arising misconceptions immediately.

Termly summative NFER assessments, not only allows teachers to evaluate how each individual child is progressing in their mathematical learning journey at St Augustine’s, but they provide a robust whole school overview for the Maths Lead and SLT within our school.

These assessments are further utilised so as to support staff in adjusting their planning accordingly to meet the emerging needs of the children and to ensure additional time can be allocated to specific concepts where necessary.

All of this provides the Maths Lead and SLT a clear insight with regards to where the strengths and areas that require further developing within the school lie. From this, the Maths Lead is able to tailor the CPD and training so as to focus additional support and training where required for the whole staff or individual teachers.

Pupils enjoy their maths learning and talk enthusiastically about their maths lessons. They enjoy the ownership of having their own Power Maths workbooks and thrive from being challenged to deepen their understanding. Children can talk like mathematicians, using the highest standard of mathematical language and vocabulary to talk about their learning. Children really understand the mathematics they are doing and can show this through not just getting the correct answer but explaining their learning and showing this confidently.

The combination of all of these systems allows us to judge the impact of the maths curriculum in our school.