The

Rosary Trust

St Clare's Catholic Primary

School

Mathematics Policy

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St Clare's Mathematics Policy

October 2024

Mission Statement:

With Jesus we learn to love and love to learn.

Introduction and aims

Mathematics is a core subject within the National Curriculum. Mathematics is the foundation of many skills integral to everyday life; therefore the teaching of mathematics aims primarily to equip pupils with an ability to apply the subject in the real world. We endeavour to ensure that children develop a healthy, confident and enthusiastic attitude towards mathematics that will stay with them throughout their lives. We aspire for children to be able to appreciate the beauty and power of mathematics, and develop a genuine enthusiasm and enjoyment for the subject.

We aim to provide children with three main sets of skills:

Fluency: We aim for children to become fluent in the fundamentals of mathematics through varied and frequent practice of increasingly complex problems over time so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. Through careful exposure of the structure of mathematics, children will be able to make connections within and across the different strands of mathematics; enabling them to become fluent in all aspects of maths.

Mathematical reasoning: We aim for children to learn to reason mathematically by following a line of enquiry, conjecturing relationships and generalisations and developing an argument, justification or proof using mathematical language. The development of mathematical language is key to reasoning, therefore we teach using the appropriate mathematical vocabulary.

Solving problems: We aim for children to be able to 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 is grounded in the use of representations which expose the structures of problems and enable children to solve problems with greater accuracy.

Teaching and Learning

Our aim at St Clare's is for all children to enjoy mathematics and have a **secure** and **deep** understanding of fundamental mathematical concepts and procedures when they leave us to go to secondary school. We want children to see the mathematics that surrounds them every day and enjoy **developing vital life skills** in this subject.

Aims for our pupils

• To develop a growth mindset and positive attitude towards mathematics. All Children should feel like successful mathematicians and their achievements should be celebrated.
• To become confident and proficient with number, including fluency with mental calculation and look for connections between numbers.
• To become problem solvers, who can reason, think logically, work systematically and apply their knowledge of mathematics. Reasoning is for everyone. We aspire for all children to reason in every lesson.
• To develop their use of mathematical language.
• To become independent learners and to work co-operatively with others.
• To appreciate real life contexts to learning in mathematics.

Introduction

In September 2019, St Clare's began transitioning towards a mastery approach to the teaching and learning of mathematics. Regular training is continually broadening the staff's understanding of teaching for mastery, and staff school-wide are confidently teaching in line with mastery values. 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.

Now confidence in the teaching of mastery is developing, discrete maths will be taught in daily morning sessions as follows:

Key Stage 1 approximately 50 minutes, supplemented by ten minute 'Mastering Number' sessions

Key Stage 2 it is approximately one hour, supplemented by a ten minute 'Daily Maths Meeting' for revisiting, consolidating, and deepening learning.

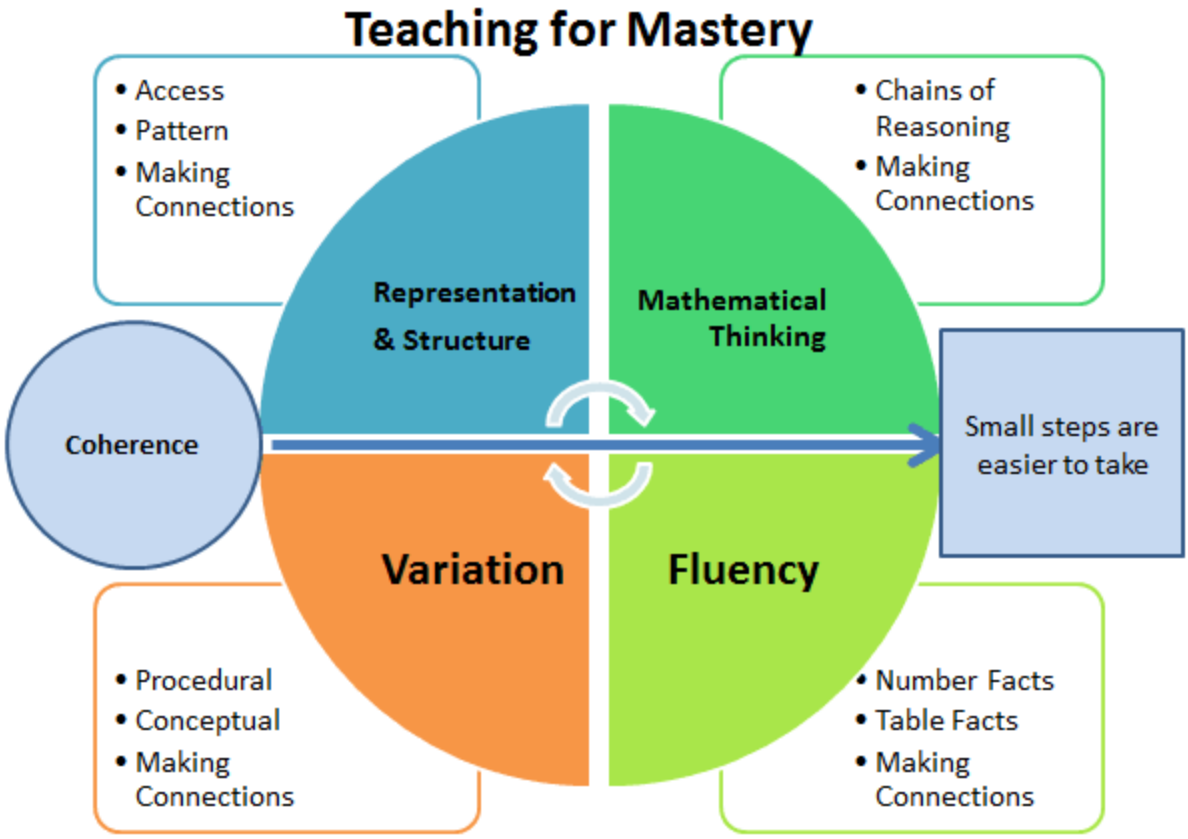
Year 4 and 5 classess take part in 15 minute daily Masering Number sessions in place of maths meetings.

Foundation Stage approximately 45 minutes of maths teaching over the course of a day.

As a school that teaches for mastery, we aspire that within each lesson there should be a concrete (using manipulatives) pictorial (pictures or real life scenarios) and abstract elements to the lesson. Whilst this is not strictly in line with the whole class mastery approach it is helping the children towards this approach.

As we continue to progress on our journey to Mastery, teaching approaches we will be implementing the following big ideas:

5 Big Ideas of Mastery 1



Our teaching for mastery is underpinned by the NCETM's 5 Big Ideas.

• Opportunities for ***Mathematical Thinking*** allow children to make chains of reasoning connected with the other areas of their mathematics.

• A focus on ***Representation and Structure*** ensures concepts are explored using concrete, pictorial and abstract representations, the children actively look for patterns and generalise whilst problem solving.

• ***Coherence*** is achieved through the planning of small, connected steps to link every question and lesson within a topic.

• Teachers use both procedural and conceptual ***Variation*** within their lessons and there remains an emphasis on ***Fluency*** with a relentless focus on number and times table facts.

8 Classroom Norms to Establish:

1. Everyone can learn mathematics to the highest levels – all learners are methmeticians.
2. If you 'can't do it', you 'can't do it ***yet***'.
3. Mistakes are valuable.
4. Questions and noticing skills are important.
5. Mathematics is about creativity and problem solving.
6. Mathematics is about making connections and communicating what we think.
7. Depth is much more important than speed.
8. Mathematics lessons are about learning, not performing.

Teaching for Mastery Principles

• **It is achievable for all** – we have high expectations and encourage a positive 'can do' mindset towards mathematics in ***all*** pupils, creating learning experiences which develop children's resilience in the face of a challenge and carefully scaffolding learning so everyone can make progress.

• **Deep and sustainable learning** – lessons are designed with careful small steps, questions and tasks in place to ensure the learning is not superficial.

• **The ability to build on something that has already been sufficiently mastered** – pupils' learning of concepts is seen a continuum across the school.

• **The ability to reason about a concept and make connections –** pupils are encouraged to make connections and spot patterns between different concepts (E.g. the link between ratio, division and fractions) and use precise mathematical language, which frees up working memory and deepens conceptual understanding.

• **Conceptual and procedural fluency** – teachers move mathematics from one context to another (using objects, pictorial representations, equations and word problems). There are high expectations for pupils to learn times tables, key number facts (so they are automatic) and have a true sense of number. Pupils are also encouraged to think whether their method for tackling a given calculation or problem is Appropriate, Reliable and Efficient (A.R.E).

• **Problem solving is central** – this develops pupils' understanding of why something works so that they truly have an appreciation of what they are doing rather than just learning to repeat routines without grasping what is happening. Reasoning is for all children and all children need to reason so they can make the mathematical connections essential to for mastering maths.

• **Challenge through greater depth** - rather than accelerated content, (moving onto next year's concepts) teachers set tasks to deepen knowledge and improve reasoning skills within the objectives of their year group.

<u>Curriculum design and planning</u>

• Staff use a number of resources to help plan their lessons including ***White Rose Maths Schemes of Learning and the NCETM curriculum framework.*** As a starting point in order to develop a coherent and comprehensive conceptual pathway through the mathematics. Our intention is to move towards a focus on the **whole class progressing together**. Collaborative planning with year group colleagues is encouraged to ensure consistency.

• Learning is broken down into small, connected steps, building from what pupils already know. The lesson journey should be detailed and evident on flipcharts (Smart Notebook or PowerPoint). These should be saved on the school system for reference and as a resource

for others. Maths planning is expected and teachers are expected to plan using the Concrete, Pictorial, Abstract model if not teaching mastery approach lessons.

- Lessons should start with a recap of previously taught content.
- Planning should reference the small steps required to access the lesson and these should be revised before progressing.

• 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. These may include ***White Rose Maths Schemes of Learning and Assessment Materials***, ***Maths No Problem*** textbook activities, ***NCETM Mastery Assessment*** materials, ***NRICH***, visual images and concrete resources.

- Reasoning opportunities are used in every lesson and are expected to be engaged with by all children through modelled support and then independent application.

• Opportunities for extra fluency practice (*instant recall of key facts, such as number bonds, times tables, division facts, addition and subtraction facts*) should be provided outside mathematics lessons (morning starters or post-lunch in Daily Maths Meetings).

<u>Lesson Structure</u>

• 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.

- STEM sentences are displayed in the classroom and used to support children's ability to discuss, understand and engage with the structure of the maths.

• 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) 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.

As we are moving towards greater security regarding our whole school mastery approach below are some teaching principles we have adopted at St Clare's:

1. A clear and organised variety of lessons based on the distinct domains within the programmes of study of number, measurement, geometry and statistics. Year 6 will also study algebra, and proportion and ratio.
2. A rich variety of teaching and learning strategies, including:

- individual work
- paired work
- group work
- class work
- the development of mental strategies
- written methods (informal and formal)
- practical work
- investigative work
- problem solving
- mathematical discussion
- consolidation of basic skills and number facts

3. An emphasis on rapid mental calculation.
4. An emphasis on the ability to rapidly recall the expected times table facts.
5. Controlled scaffolding of learning, with all pupils engaged in a strand of mathematics relating to a common theme. More able pupils who grasp concepts rapidly should be challenged to broaden their understanding by 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 through additional practice before moving on.

Marking

Marking of mathematics books should be completed in line with the St Clare's marking policy. Next steps and live marking should be carried out by an adult on a daily basis with a group of pupils within the class. The groups should change daily so all children get feedback from an adult so that the teacher can make necessary adjustments to subsequent lessons. Wherever possible lessons will be sequential so that children are building on secure knowledge. However, it is essential that all marking picks up and addresses any misconceptions/mistakes and thorough questioning ensures children have clarified their thinking clearly. Pupil review and peer marking will be used this is so children have the opportunity to see review their own work and give them the opportunity to check misconceptions for themselves.

Assessment and Record Keeping

In addition to the formative assessment undertaken in lessons, teachers will use termly NFER summative assessments to reinforce their judgements and provide further opportunities to identify gaps in pupil learning and tailor future lessons. Teacher judgements are then entered onto ***Target Tracker*** half termly and teachers talk through the progress of their pupils at termly tracking progress meetings: this ensures targeted support can be given to those who need it.

Teaching in attainment groups

With the transition to mastery, the school is reviewing its long-standing policy of teaching in attainment groups in Year 6. Historically, in these year groups, it was felt that grouping pupils by attainment would help teachers tailor learning to their needs.

Inclusion and Special Needs

St Clare's 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. SEN pupils may be supported by additional adults, different resources, differentiated activities. They may also complete additional activities outside of the mathematics lesson or be taught in a smaller class size (Year 6). 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 concepts and may need careful scaffolding or extra time/support. Number Stacks is now being used as a school wide intervention scheme to help teachers identify and fill gaps.

Home/School Link

At St Clare's we encourage parents to be involved in the mathematics curriculum by:
• Providing parents with guides outlining what mastery teaching involves in EYFS and KS1 & KS2 and how they can support at home.
• Running teaching for mastery curriculum evenings and workshops throughout the year.
• Inviting parents in twice a year for parents evening to discuss their child's progress.
• Reporting on mathematical progress in their child's report.
• Using our mathematics page on the school website to provide information about how we teach the four calculations as pupils move through the school.

- Sending home half termly KIRF targets so parents and carers can support their child to learn their Key Instand Recall Facts.
- Communication about progress in KIRF assessments are sent home.
- KS1 use Numbots and KS2 use Times Table RockStars

Pupils are provided with mathematics home-learning on a weekly basis.

Early Years Foundation Stage (EYFS)

Children in EYFS explore mathematical concepts through active exploration and their everyday play-based learning. Children are taught key concepts and develop number sense 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. Pupils explore the 'story' of numbers to twenty and the development of models and images for numbers as a solid foundation for further progress. 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. Mathematics 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 National Curriculum.

Role of the Subject 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.

• Leads continuing professional development; facilitates joint professional development – especially Lesson Study; provides coaching and feedback for teachers to improve pupil learning.

• 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 mathematics issues.

• 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.

Cross Curricular Links

Mathematics contributes towards many other subjects, and it is therefore vital that the children are given opportunities to apply and use mathematics in real contexts across the whole curriculum.
Computing: The aim is that teachers will incorporate this whenever possible into mathematics lessons. Strong links will be made between modelling, controlling and graphics in the Computing Curriculum.
Mathematics specific computing resources will be used in small groups and whole class teaching sessions when beneficial to supporting the objectives.
When it is appropriate, skills and concepts learned within mathematics lessons are followed up and reinforced within all other curriculum areas. These links are made explicit to the children.

Resources

Resources for the delivery of the maths curriculum are stored both centrally and in classrooms. Everyday basic equipment is kept in classrooms. Additional equipment and topic-specific items are stored centrally.
St Clare's Primary School uses a variety of published materials to facilitate the teaching of mathematics but recognises the need for the teaching of maths to be 'scheme assisted not scheme driven.'
Materials are constantly updated, as new and relevant items become available. The Maths subject leader orders new resources after consultation with the staff.

Role of the Parent/Guardian

At St Clare's, we recognise that parents/guardians have a vital role to play in the education of their children. We welcome their support across the curriculum. In mathematics, we work in partnership with them in a number of ways:

- We inform parents of the key areas to be taught in each year group, offering ideas of how they can support their child.
- We offer half termly KIRF support sheets so parents can support their child at home to develop their fluency.
- Through the weekly homework set as outlined in the homework policy.
- Through the expectation that they will help to reinforce the learning of their child's progress both verbally (parental consultation sessions) and by means of written formal reports.
- Through discussion at parental consultation sessions about their child's targets and achievements in mathematics.

Role of Governors

The governing body at St Clare's has the responsibility of ensuring that mathematics is taught in line with the Government guidelines and follows the ethos of the school. This is overseen by the designated governor for mathematics who liaises with the curriculum committee and the subject leader to ensure that high standards are maintained. When possible, the designated governor will visit the school on a termly basis to observe lessons and, at least once a year, discuss the development of mathematics with the subject leader.