ST JOSEPH'S CATHOLIC PRIMARY SCHOOL

Mathematics Policy

June 2021

Philosophy

The Nature of Mathematics:
Mathematics teaches us how to make sense of the world around us through developing a child's ability to calculate, to reason and to solve problems. It enables children to understand and appreciate relationships and pattern in both number and space in their everyday lives. Through their growing knowledge and understanding, children learn to appreciate the contribution made by many cultures to the development and application of mathematics.

The new National Curriculum states that:
"Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject."

At St Joseph's we see Maths very much as an interconnected and consistent subject which should encourage creativity. As much revolves around the discussion about Maths between talk partners as it does the completion of calculations. We want the children to see Mathematics as being relevant to their world and applicable to everyday life as well as being something that they will need as they move on through their school life and ultimately to the world of employment. To that end, a high-quality, inter-related and creative Maths experience should be one that develops the children's ability to think mathematically and one which allows them to apply the tools to which they have been exposed in a variety of ways.

Following the introduction of the new National Curriculum in 2014 the emphasis has been to ensure that all children:

- Become **FLUENT**
- **REASON** and **EXPLAIN** mathematically
- Can **SOLVE PROBLEMS**

This means that children need to be regularly exposed to opportunities involving increasingly complex problem solving which allows them to apply their Maths knowledge. In doing so they should be encouraged to develop an argument and line of enquiry which they can prove and justify using mathematical vocabulary. This includes the ability to break down problems, both routine and non-routine, into a series of steps.

Aims and Objectives

We want to teach Maths in a way that:

- delivers Maths in line with new National Curriculum guidelines;
- creates a lively, exciting and stimulating environment in which the children can learn Maths;
- promotes the concept that acquiring Maths knowledge and skills provides the foundation for understanding the world around the children;
- encourages children to use mathematical vocabulary to reason and explain;
- allows time for partner talk in order to stimulate and develop a curiosity for Maths;
- challenges children to stretch themselves and take risks in their learning;
- to promote confidence and competence with children's understanding of numbers and the number relationships;
- provides children with the opportunity for deepening their understanding;
- to develop the ability to solve problems through decision-making and reasoning in a range of contexts.

Intent, Implementation, Impact

Intent:

At St. Joseph's we follow the Mathematics Mastery approach through the ARC programme, which has three key principles: deep understanding, mathematical thinking and mathematical language, with problem solving at the heart of the curriculum. Instead of learning mathematical procedures by rote, we want pupils to build a deep conceptual understanding of concepts which will enable them to apply their learning in different situations. The habits of thinking mathematically are life-enriching as it is vital to be numerate to participate fully in society. Therefore, we ensure we make rich connections across mathematical ideas to develop those skills from EYFS to Year 6.

Implementation:

The Mathematics Mastery programme has provided curriculum resources alongside professional development. Therefore, all teaching staff have now been fully trained in implementing the approach in their classrooms ensuring consistency throughout school.

The Mathematics Mastery curriculum is cumulative - each school year begins with a focus on the concepts and skills that have the most connections, and this concept is then applied and connected throughout the school year to consolidate learning.

As Mathematical language is a key principle of our approach, at the start of each new topic, key vocabulary is introduced, revisited throughout lessons and embedded as the topic progresses.

Children are taught through the C-P-A (Concrete – Pictorial – Abstract) approach. This allows teachers to show clear modelling and reinforce the learning that is achieved by going back and forth between the representations, building pupils' conceptual understanding.

Teachers also use a six part lesson structure which allows the lesson to be pacey whilst the children to acquire a new skill, apply the skill and deepen the skill within the lesson.

Feedback is given on children's learning in line with our marking and feedback policy. Formative assessment within every lesson helps teachers to identify misconceptions, the children who are ready for a challenge or the children who need to access support through same-day interventions.

Impact:

The Mathematics Mastery approach allows children to develop their mathematical fluency whilst being able to apply this knowledge through reasoning and problem solving. Therefore, children are able to move between different contexts and representations of maths flexibly. They are also able to show a concept in multiple ways, use mathematical language to explain their ideas and can independently apply the concept to new problems in unfamiliar situations.

Pupils need to be fluent, but that fluency must encompass understanding and be accompanied by reasoning and problem solving.

Approach

St Joseph's are currently following the Maths Mastery ARC Programme from Reception to Year 6. "At the centre of the mastery approach to the teaching of mathematics is the belief that all pupils have the potential to succeed. They should have access to the same curriculum content and, rather than being extended with new learning, they should deepen their conceptual understanding by tackling challenging and varied problems. Similarly, with calculation strategies, pupils must not simply rote learn procedures but demonstrate their understanding of these procedures through the use of concrete materials and pictorial representations." (Maths Mastery Calculation Policy, 2017 – Staff Share, Appendix 1. School website – Our Learning – Maths Mastery.)

It is important that children are allowed to explore Maths and present their findings not only in a written form but also visually; to that end the school will adopt the CPA approach: concrete, pictorial, abstract. This will allow the children to experience the physical aspects of Maths before finding a way to present their findings and understandings in a visual form before relying on the abstract numbers. All teaching staff at St Joseph's attend staff meetings that regularly have a Maths focus, which provide information on current thinking and introduces them to new teaching methodologies and ideas.

Mathematics Mastery

Maths - Expectations

Through careful planning and preparation we aim to ensure that consistency is carried out throughout the school as children are given opportunities for:

- Six-part lesson which contains; Do it now task, new learning, talk task, develop learning, independent task and a plenary.
- Maths meetings – 10/15 minutes, 3 x per week.

(Maths Expectations attached – Appendix 2)

Planning

With the exception of Foundation stage 1, teachers will use a six-part lesson plan which consists of; Do it now task, new learning, talk task, develop learning, independent task and a plenary. Lessons are planned using a common planning format (Appendix 3) and are monitored by the MMSL (Mathematics Mastery Subject Lead) in line with the school's Monitoring Plan.

Planning should demonstrate children's learning being deepened throughout the lesson – this could be completed through using practice/deepen stickers. The practice section is used to practice a key skill from the lesson, the deepen section is to deepen the understanding of the new learning. (Appendix 4) During every lesson children will be allowed to engage in mathematical discussion through the 'talk task' and problem solving through the 'deepening learning' section of the lesson.

All staff in FS2 to Y6 have been given 'Mathematic Mastery folders', suitable for their year group, which contains information about the key principles, programme of study, maths meeting suggestions and CPA approach.

Marking

Work in mathematics can generate a great deal of marking and it is recognised that it is not always desirable to mark every piece of work. The children themselves can mark exercises which involve routine practice with support and guidance from the teacher. Where appropriate; children in Years 5 and 6 are encouraged to check computational exercises with a calculator. This can foster independence in the children, who can seek help if they are unable to locate and correct their errors. However, children will be provided with feedback either verbally or through written marking.

Often, in order to clarify understanding of a concept, children will be set a 'Practice/Deepen' task or a written feedback task, but not always for every lesson; these should be completed by the children at the next earliest opportunity after the lesson. When marking work, teachers should adhere to the school's Marking Policy – Staff share.

Some marking methods may include:

VF – verbal feedback given T – Teacher Help TA – Teaching Assistant Help

Assessment

In order to inform planning and to assess children's progress, teachers will use AfL (Assessment for Learning) opportunities throughout their lessons. Assessment will also be informed by annotated plans and work in children's books. Termly, children will be assessed through the application of White Rose Hub Maths assessment tests; this summative assessment will be used in conjunction with the RAG assessment grids given to identify next steps and therefore inform planning.

Teachers are expected to share progress and assessment details on a termly basis as part of 'Pupil Progress Meetings'.

Most KS2 pupils will sit a formal test during the summer term which will include the Y6 SAT tests.

Resources and Displays

Each classroom will be resourced with materials to support the delivery of Maths; such items might include number lines, multiplication tables, 100 squares, 2D and 3D shapes, multilink cubes, dice, Numicon, Cuisenaire rods and other items. Larger materials such as scales, trundle wheels and measuring cylinders will be held centrally in the Maths cupboard.

Resources should be visibly displayed and easily accessible as children should be encouraged to use whatever resources are available to them in the classroom and which they feel would be beneficial to help them when completing Maths work.

Each classroom should have a display dedicated to Maths. Each class from FS1 – Y6 should have a Maths Meeting board which is used 3 x per week for 10/15 minutes. The maths meeting board should be used to cover certain topics which will be visited in future terms or pre-learning for the next lesson. Suggested ideas for each class are given in the Maths Mastery handbook. KS2 should also have calculation examples for – addition, subtraction, multiplication and division on display.

Inclusion

"At the centre of the mastery approach to the teaching of mathematics is the belief that all pupils have the potential to succeed." (Maths Mastery Calculation Policy, 2017 – Staff Share, Appendix 1. School website – Our Learning – Maths Mastery.) Each child will have an equal entitlement to all aspects of the Maths curriculum and to experience the full range of Maths activities.

Therefore, in delivering Maths, care will be taken to ensure that a variety or learning styles are accessed and teaching methods adopted so that the majority of children can access the learning objective.

Intervention groups will take place both within the Maths lesson and outside; these sessions may be delivered by the teacher or teaching assistant and may involve

individual or small group work. Teaching assistants (TAs) have completed a staff meeting with the MMSL on intervention guidance for maths mastery. All TAs have been given a 'Maths Mastery Intervention Guidance' folder which contains tasks to 'close the gap' in children's learning – with a focus on place value and number.

Parental Involvement and Reporting to Parents

It is important that parents and carers are actively involved in the children's education. In order to help keep them informed of what is happening within school we have run information sessions, for FS2 – Y6, which looked at current developments within the school, new methodologies for delivering the teaching of Maths and also any new statutory changes such as curriculum or assessment/testing arrangements.

Reports are completed before the end of the summer term and parents are given opportunity to discuss their child's progress on two separate occasions: Parent Review Meetings (Autumn Term) and Parents Evening (Spring Term).

Teachers from FS2 – Y6, also set weekly home learning on "Learning with Parents", previously "Maths with Parents", to ensure that children are practising the skills taught in schools at home. Learning with Parents is linked to mathematic mastery which allows the children to be working on the same objectives at home as they do in school and also increase parental engagement.

Teachers use the information gathered from their half termly assessments to help them comment on individual children's progress.

The Governing Body:

We have identified a mathematics governor.

The mathematics governor visits the school yearly (formally) to talk with the mathematics co-ordinator and other teachers; and when possible, observes some daily mathematics lessons.

The mathematics governor reports back to the learning and development committee half termly and feedback is given at full governing body.

S Hampsey: Mathematics co-ordinator and MMSL

Date: June 2021

Appendix 1

Mathematics Mastery

Progression in calculations

Year 1 – Year 6*

September 2017

NB. Users should familiarise themselves with the introduction (pp 2-10) to this document before referring to individual year group guidance.

**Progression guidance is not provided for EYFS/Reception since the focus should be on the understanding of early number concepts and number sense through the use of concrete manipulatives, as exemplified in the programmes of study.*

Staff Share – Maths – Progression in calculations Y1 – Y6.

School website – Our Learning – Maths Mastery.

Appendix 2

Maths Mastery Expectations

- All teachers to plan for and use a 6 part lesson structure. (From Autumn term in KS1 and definitely by the summer term for Reception).
- Teachers should plan maths lessons using the Mathematics Mastery toolkit and school proforma.
- Teachers should use the concrete-pictorial-abstract approach for every topic taught; either within a lesson or across a unit.
- Encourage active thinking and communication of mathematical ideas and problem solving.
- Maths meetings, in 10 minute slots, should happen at least 2 x per week.
- Every lesson should include an opportunity for depth.
- Use transitions as an opportunity to reinforce previously learnt knowledge and softly expose pupils to new concepts.
- All children should be encouraged by the teacher to speak in full sentences when answering and discussing questions.
- Use language as a tool to deepen knowledge and understanding and as an assessment for learning technique. There must be opportunities for pupils to talk about what they are discovering and practise using mathematical language, even if initially this is a 'repeat after me' scenario.
- If tasks need to be differentiated, this should happen by outcome not by objective.
- Stick to the 'fewer topics, greater depth' principle, i.e. not racing to climb the curriculum but exploring its depth.
- Work in books should be marked regularly to enable same day interventions to happen.
- Feedback should include a practice/deepen sticker to provide an opportunity for fluency and deepening a concept.
- Maths Mastery interventions (1st Class @ Number and Success @ Arithmetic) should be put in place and used for children to keep up not catch up.
- Keep maths lessons pacey, enjoyable and with 100% participation.

Numeracy Weekly Planning

St Joseph's Primary School
a Catholic Voluntary Academy

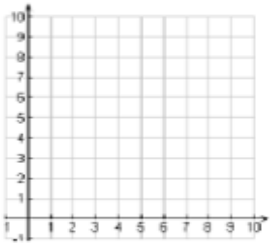
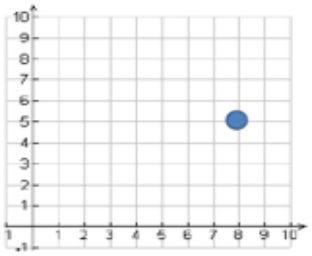
Year	Date	Term
Star Words (Key Vocabulary)		
SEN pupils		

MASTERY SESSIONS:

- Do Now – This is a quick task all pupils can access without any teacher input as an introduction to the maths lesson.
- New Learning – Introduces the main maths concept for the day's lesson.
- Talk Task – Practices the new learning by talking about maths with key vocabulary.
- Develop Learning - **Depth activity.**
- Independent Task – Learning independently through **problem solving.**
- Plenary – Recaps on lesson, checking understanding and celebrating success.

Day	DO IT NOW TASK	New Learning	Talk Task	Develop Learning	Independent Task	Plenary

Appendix 4

U12:L3	
Practice	Deepen
• Draw the shapes on the co-ordinates given.   (2, 6)  (6, 2)  (9, 0)	Point A is marked on the grid.  Henry says that point A is at (5,8) Aisha says that point A is at (8,5) Who is correct? Why?

U2:L7	
Practice	Deepen
Show your working to these equations. 3243 + 4428 = 3484 + 1723 =	Julie has 5782 stamps, Heidi has 4562 stamps. How many stamps do they have altogether?

U3:L8	
Practise	Deepen
Harvey has written a number sentence. 13 x 0 = 0 Is he correct?	Holly has 1 box of 12 eggs. How many eggs does she have? Sally has 0 boxes of 12 eggs. How many eggs does she have? Write these two questions as multiplication sentences.