St John with St Michael CE Primary School Mathematics Policy

September 2021-2024

By Steven Rooney

Introduction:

This mathematics policy is a statement of the aims, principles, strategies and procedures for Mathematics throughout the school. It describes the strategy agreed by the St John with St Michael CE Primary School Governing Body for the delivery of Mathematics according to the *National Curriculum in England, Handbook for Primary Teachers, Key Stages 1&2, 2014*.

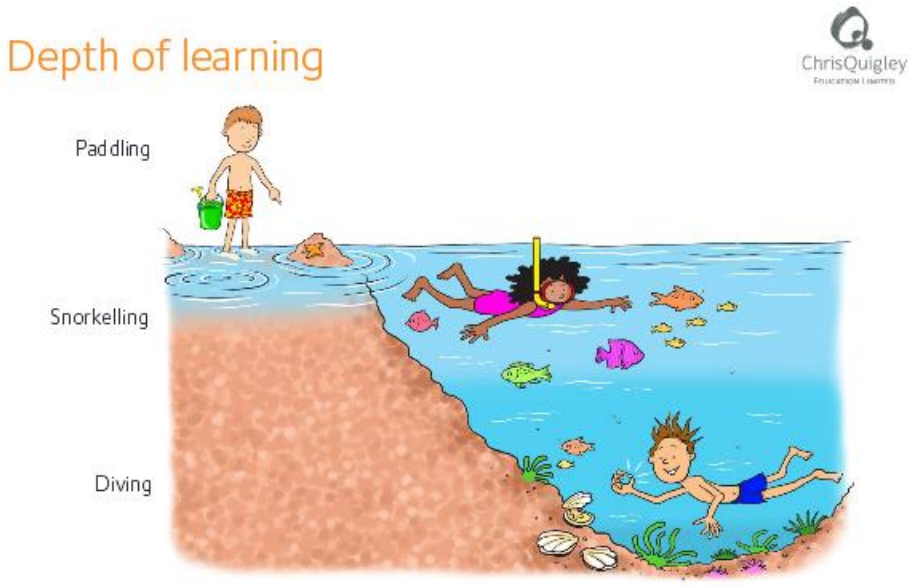
Intent:

We follow the National Curriculum for mathematics to ensure that all pupils:

- Become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately
- **Reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- 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 simpler steps and persevering in seeking solutions

Therefore, our intent is that:

- The majority of children will move through the mathematical domains to become increasingly more proficient in understanding and using mathematical knowledge, methods, language and instant recall.
- Children will use these domains at progressively deeper levels as they engage in strategies to make mathematical connections that require mathematical reasoning when using information. This is represented in the diagram below where pupils progress from paddling (basic skills), to snorkelling (advancing in their ability to use those basic skills), to diving (mastery of those skills demonstrated in solving sophisticated problems at their year level).
- Children will be able to independently apply their mathematical knowledge and reasoning strategies to solve problems of increasing complexity.



Objectives:

Below are the bi-yearly expectations that children should be able to complete. Calculations are taught in accordance to our *Calculation Policy, 2021*

Early Years Foundation Stage (EYFS)
Children are supported in developing their understanding of problem solving, reasoning and numeracy in a broad range of contexts in which they can explore, enjoy, learn, practise and talk about their developing understanding. Teachers offer opportunities for these skills to be practised, in order to give children confidence and competence in their use. By the end of Foundation Stage, children should:

- have begun to develop confidence and mental fluency with whole numbers, counting and place value when working with numerals and words in addition and subtraction
- know the number bonds to 10
- be able to recognise, draw and sort different shapes, using mathematical language
- compare different quantities such as length, mass and capacity/volume
- read and spell mathematical vocabulary consistent with their spelling and reading knowledge.

Key Stage 1
By the end of Key Stage 1, children should:

- have developed confidence and mental fluency with whole numbers, counting and place value when working with numerals, words and the four operations
- know the number bonds to 20 and precisely use place value
- be able to recognise, describe, draw, compare and sort different shapes, using mathematical language
- describe and compare different quantities such as length, mass, capacity/volume, time and money
- read and spell mathematical vocabulary consistent with their spelling and reading knowledge.

Lower Key Stage 2
By the end of year 4, children should:

- be increasingly fluent with whole numbers and the four operations, including number facts and place value, so they develop efficient written and mental methods and perform calculations accurately with increasingly larger numbers
- have memorised all multiplication tables and show they can proficiently use them, evidenced by data from the statutory multiplication tables check
- develop their ability to solve a range of problems, including simple fractions and decimal place value
- draw with increasing accuracy and develop mathematical reasoning to analyse shapes and their properties, and confidently describe the relationships between them
- confidently use measuring instruments with accuracy and make connections between measure and number
- count across zero using negative numbers
- read and spell mathematical vocabulary consistent with their spelling and reading knowledge.

Upper Key Stage 2
By the end of year 6, children should:

- have extended their understanding of the number system and place value to include larger integers
- develop connections between multiplication and division with fractions, decimals, percentages and ratio
- develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation
- be introduced to the language of algebra as a means for solving a variety of problems
- consolidate and extend knowledge developed in number, in geometry and measures
- classify shapes with increasingly complex geometric properties and learn the vocabulary they need to describe them
- be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages
- spell and pronounce mathematical vocabulary correctly

Implementation:

Teachers plan a maths lesson for one hour per day using *Power Maths* (by Active Learn Primary). See Appendix 2 page 11 for 'Mathematics Lesson Guideline. Teachers also use Target Your Maths resources to develop fluency and these lessons supplement our Power Maths lessons.

Purple Mash

Purple Mash can be used both at school and for home learning. It provides a creative online programme for pupils to practise and consolidate skills learnt in class. Teachers can set tasks that build on existing knowledge through engaging in online activities and games, accessible across a range of devices, such as tablets, laptops and desktops. It allows:

- Maths skills development and practice
- Communication between teachers and pupils
- Editable long term and daily planning
- Computing skills
- Parental engagement

Times Tables Rock Stars

To improve fluency and accuracy in rapid recall of times tables and division facts, TTRS is practised 3x weekly, currently from Y1 to Y6. The aim is for children to be fluent in their recall and application of multiplication and division facts by the end of Year 4.

Consistency in using Calculations

St John with St Michael CE Primary School's Calculation Policy outlines the calculation practices to be taught across the school. Teachers are asked to use the representations on 'working-wall' displays as children are learning them in the class.

Maths in Cross-curricular

Opportunities to use mathematics in other areas of the curriculum such as in science, geography, P.E and ICT, are used at teacher discretion to support teaching and learning where appropriate.

Bookwork and Marking:

Children's Books

- Front Cover - the front of children's books should be set out as follows so we have consistency across the school:
  - Full name
  - Mathematics
  - Class ___ Book __
- Setting Out – children should be continually encouraged to set their work out as follows:
  - Children should be guided to write the long date on their page
  - Missing a line, underneath the date, children should then write L.O: _____ (Learning Objective). The LO needs to include subject specific language so the children are encouraged to verbally use that language.
  - Children should write one digit per square for all number work.
  - Children, particularly in EYFS and KS1, should be consistently encouraged to write numerals correctly by all staff.
  - Please see Appendix 1 for the 'Mathematics Layout Guidelines'.

Marking & Feedback

Teaching staff adhere to the following guidelines when marking children's work

- Tick correct work and highlight the LO when achieved.
    - Green – achieved
    - Pink – working towards
- Use a dot if work is incorrect in pink pen.
- Make a comment where a child is repeatedly making an error. If you spoke to the child during the lesson and modelled the concept in their book, put 'VF' to indicate that verbal feedback has been given
- Use stickers at your discretion.
- Use self-marking and peer marking at the teacher's discretion in purple pen
- Marking needs to be done in preparation for the next time children use their books.

Assessment:

Work will be assessed in line with the Assessment Policy. Formative and summative assessments are used together with key objectives and age related expectations to inform planning and to enable focused intervention when those expectations have not been met.

Assessment and Record Keeping

Assessment is continuous and on-going and comprises of formative and summative assessments.

- Reception children will follow end of Foundation Stage assessments.
- End of Key Stage SATs in Years 2 and 6. SATs results are published in accordance with Government legislation.
- NTS assessments will take place termly for each year group.
- End of Unit Power Maths assessments will also take place.
- Year 4 multiplication tables check takes place in the summer term

Homework:

In Key Stages 1 and 2, homework is given on a regular basis. This is provided in order to consolidate and develop the mathematics work carried out in the classroom. The children also have the opportunity to access Purple Mash online consolidation games on desktops, laptops or tablets at home. These activities and games are assigned at the class teacher's discretion.

Inclusion:

We aim to provide for all children so that they achieve as highly as they can in Mathematics, according to their individual abilities. We will identify which pupils or groups of pupils are under-achieving and intervene to improve their attainment. Gifted children will be identified and suitable learning challenges provided.

Equal Opportunities:

St John with St Michael CE Primary School has universal ambitions for every child, whatever their background or circumstances. Children learn and thrive when they are healthy, safe and engaged.

In order to engage all children, cultural diversity, home languages, gender and religious beliefs are all celebrated. Our curriculum includes a wide range of texts and other resources which represent the diversity and backgrounds of all our children.

We believe in 'valuing what the child brings to school' and recognise the importance of supporting a child's first language, not only to foster self-esteem, but to assist in the learning of mathematical language in English.

Role of Subject Leader:

The role of the Maths Lead is to be responsible for improving standards of teaching and learning in Mathematics through:

- Monitoring pupil progress
- Support colleagues in planning
- Take the lead in policy development
- Purchasing and organising resources
- Keeping up to date with developments within Mathematics and share information with other staff
- Planning for INSET as required

This policy should be read in conjunction with the following school policies:

- Teaching and Learning Policy
- Calculation Policy
- Marking policy
- Special Educational Needs Policy
- ICT Policy
- Equal Opportunities Policy
- Health and Safety Policy

This policy will be reviewed every three years, or in the light of changes to legal requirements.
Written by Steven Rooney
September 2021

APPENDIX 1

Mathematics Layout Guidelines

- Mathematics exercise books will have squared paper with the size of squares appropriate to the year group.
- Each lesson will start on a new page.
- The date will be written on the top line in the long date format with a comma after the day and the month:

  Thursday**,** 13th October**,** 2015

- After the date, miss a line and then write the L.O.
- After the L.O, miss a line and then start the first calculation.
- Numbers will be written with1 digit in 1 square.

1	3	+	2	7	=	4	0

- Operations +, - , x, ÷, and = will be written in 1 square.
- When writing vertical calculations, H T U to be written above the columns and answer lines to be drawn with a ruler.

		H	**T**	**U**			
		3	2	2			
	+		3	7			
		3	5	9			

- When writing vertical calculations, the operation to be shown to the left of the digits and not under the last column.
- When writing vertical calculations, all answer lines to be drawn with a ruler.
- When writing vertical calculations, the carry digit to be written under the next column.

		H	**T**	**U**			
		3	7	2			
	+		4	7			
		4	1	9			
		1					

- When writing vertical subtractions,

- the *take* digit to be written to the upper left of the digit in the next column.
- the *reduced* digit to be written to the upper left of the digit which is crossed out.

		H	**T**	**U**			
		5 ~~6~~	12	7			
	-	1	3	5			
		4	9	2			

- Decimal point

  The decimal point will be written on the line between the digits

		1•	2	3			

Notes:

- When modelling calculations on the board, remember that different colours can be used to highlight HTUs or the digits involved in the calculation to aid understanding by the children.

APPENDIX 2

Mathematics Lesson Guidelines

In order to provide consistency across year groups, the daily mathematics lesson will follow the format below. All children's work in exercise books will follow the *Mathematics Layout Guidelines* as outlined in Appendix 1. Appropriate mathematics resources to be available and used by the children.

Typical Lesson

A typical lesson will comprise (approx timings):

Power Up Starter (10 mins)
This can include oral and mental games and activities from Power Maths or Big maths (either CLIC or SAFE).

Teaching input – Discover and Share (10 min)

- Input should introduce the *learning* objective(s) of the lesson.
- Activate prior learning
- Include a question for concrete manipulation so children are able to discuss and share any misconceptions

Individual and group work – Think together (10 min)

- Introduce independent task, to work through as a class with a partner or independently and reducing scaffolding as appropriate
- Differentiated work by individuals, pairs groups

Independent – Practice (25 mins)

- Teacher & Teaching Assistant to have target focus group
- Independent work with opportunities for conceptual and procedural variation
- 'Challenge' questions available for children to access at their ability level to link to other areas of maths so children can extend their understanding to a greater depth

Reflect - Plenary (5 min)
May include:

- Reasoning whenever possible
- Review work
- Reflect on the learning, misconceptions and difficulties
- Assess for the next step or stage