POTT SHRIGLEY CHURCH SCHOOL

'Be kind and compassionate to one another, forgiving each other, just as in Christ, God forgave you"

Mathematics policy (Spring 2024)

Our Curriculum Intent for Maths

Mathematics 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.

The national curriculum for mathematics aims 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 develop conceptual understanding and the ability to recall and apply 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.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects. The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. 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.

Teaching and Learning of Maths (Implementation)

At Pott Shrigley church school, children study mathematics daily covering a broad and balanced mathematical curriculum including elements of number, calculation, geometry, measures and statistics. Due to the interconnected nature of mathematics, at Pott Shrigley church school we aim to teach maths in a cross curricular manner as well as discretely to teach the practical application of mathematical skills. We focus not only on the mathematical methods but also focus on mathematical vocabulary and to use Maths Mastery to broaden and deepen mathematical understanding.

We aim for each child to be confident in each yearly objective and develop their ability to use this knowledge to develop a greater depth understanding to solve varied fluency problems as well as problem solving and reasoning questions.

We teach mixed ages classes and carefully match objectives and outcomes to ensure all children receive direct teaching from the class teacher daily and targeted support from high quality teaching assistants. This means we may move programmes of study to earlier or later in the year to ensure mathematical strands match across year groups (within a mixed age class). This has been carefully considered and planned to ensure the progression of skills in taught in the correct sequence.

We have a high proportion of SEND children so high-quality concrete and pictorial lessons/resources are key to ensure all children progress is line with their own abilities and potential. Targeted support and challenge is used in all classes to ensure children make good or satisfactory progress in mathematics.

Children may be taught in the year below their chorological age if they are working at this level. This is to ensure children succeed and progress on their own learning journey.

From the 2021/22 academic year onwards, schools in England will be required to administer an online multiplication tables check (MTC) to year 4 pupils. The purpose of the MTC is to determine whether pupils can recall their times tables fluently, which is essential for future success in mathematics. It will help schools to identify pupils who have not yet mastered their times tables, so that additional support can be provided. To support the children with their multiplication practice we use 'Times Table Rockstars' as an online and fun learning platform which also offer resources to be used in the classroom. This is used form year 2 onwards and designed to support them in the times tables in line with their current year group. For example, year 2 focus on the 2,5 and 10 times tables.

White Rose Mathematics

At Pott Shrigley church school we are pleased to closely follow the **White Rose** Mathematics scheme across the school. White Rose Maths is an organisation that aims to work collaboratively with teachers across the country to improve mathematics teaching. Inspired and informed by robust, world-class research and global maths experts, the scheme aims to transform maths education and change the experience of maths forever. The white Rose approach aims to help all pupils to ***master mathematics.***

What does it mean to *master* mathematics?

A mathematical concept or skill has been mastered when a pupil can represent it in multiple ways, has the mathematical language to communicate related ideas, and can independently apply the concept to new problems in unfamiliar situations.

Mastery is a journey and long-term goal, achieved through exploration, clarification, practice and application over time. At each stage of learning, pupils should be able to demonstrate a deep, conceptual understanding of the topic and be able to build on this over time.

This is not about just being able to memorise key facts and procedures, which tends to lead to superficial understanding that can easily be forgotten. Pupils should be able to select which mathematical approach is most effective in different scenarios.

We have invested in the Cheshire East maths hub mastery course for two teachers in the academic year of 2023-2024 to improve and develop our approach to maths mastery.

All pupils can achieve in mathematics

A positive teacher mindset and strong subject knowledge are key to student success in mathematics. It is not the case that some pupils can do mathematics and others cannot.

No pupil should be left behind. The focus is keeping up over catching up. By making high expectations clear and emphasising the value of mathematics education, pupils are encouraged to build confidence and resilience.

Abilities are neither fixed nor innate, but can be developed through practice, support, dedication and hard work. Natural talent is just a starting point and does not determine who has more or less potential to achieve. A positive teacher mindset in maths encourages a love of learning and resilience that enables everyone to achieve.

We use episodic teaching to ensure all cohorts have direct and targeted teaching daily in a mixed age setting. Our expectations are high across the school and children respond well top these expectations.

All pupils are entitled to learn key concepts and skills

Following a mastery approach enables our children to aim high. Children are taught in relevant year groups whilst also being exposed to concepts from other year groups.

It is important that high-attaining pupils fully understand key number concepts, rather than simply memorise a process. This will reap its rewards in the future at KS3, GCSE and A-level. Teachers can extend high-attaining students through depth, as opposed to acceleration onto new content.

Focus on depth and deepen understanding before accelerating content coverage

All pupils benefit from deepening their conceptual understanding of mathematics, regardless of whether they've previously struggled or excelled. Pupils must be given time to fully understand, explore and apply ideas, rather than accelerate through new topics. This approach enables pupils to truly grasp a concept, and the challenge comes from investigating it in new, alternative and more complex ways. This is key to how we deliver and extend mathematics at Pott Shrigley church school.

Multiple representations for all

Objects, pictures, words, numbers and symbols are everywhere. The mastery approach incorporates all of these to help pupils explore and demonstrate mathematical ideas, enrich their learning experience and deepen understanding. Together, these elements help cement knowledge so pupils truly understand what they've learnt.

All pupils, when introduced to a key new concept, should have the opportunity to build competency in this topic by taking this approach. Pupils are encouraged to physically represent mathematical concepts. Objects and pictures are used to demonstrate and visualise abstract ideas, alongside numbers and symbols.

- *Concrete* – Students should have the opportunity to use concrete objects and manipulatives to help them understand and explain what they are doing.
- *Pictorial* – Students should then build on this concrete approach by using pictorial representations. These representations can then be used to reason and solve problems.
- *Abstract* – With the foundations firmly laid, students should be able to move to an abstract approach using numbers and key concepts with confidence.

Fluency, reasoning and problem solving

Teaching supports the aims of the National Curriculum and we use carefully tailored mixed age planning to ensure children reach end of phase objectives.

Problem solving

Mathematical problem solving is at the heart of our approach. Pupils are encouraged to identify, understand and apply relevant mathematical principles and make connections between different ideas. This builds the skills needed to tackle new problems, rather than simply repeating routines without a secure understanding.

Mathematical concepts are explored in a variety of representations and problem-solving contexts to give pupils a richer and deeper learning experience. Pupils combine different concepts to solve complex problems, and apply knowledge to real-life situations.

Reasoning

The way pupils speak and write about mathematics transforms their learning. Mastery approaches use a carefully sequenced, structured approach to introduce and reinforce mathematical vocabulary. Pupils explain the mathematics in full sentences. They should be able to say not just what the answer is, but how they know it's right. This is key to building mathematical language and reasoning skills.

Fluency

Pupils should be able to recall and apply mathematical knowledge both rapidly and accurately. However, it is important to stress that fluency often gets confused for just memorisation – it is far more than this. As well as fluency of facts and procedures, pupils should be able to move confidently between contexts and representations, recognise relationships and make connections in mathematics. This should help pupils develop a deep conceptual understanding of the subject. Frequent, carefully designed, intelligent practice will help them to achieve a high level of fluency. We have a dedicated 10 minutes per day dedicated to developing our children's fluency and conceptual understanding.

Number at the heart

A large proportion of time is spent reinforcing number to build competency and fluency. Number is usually at the heart of any primary mastery scheme of learning, with more time devoted to this than other areas of mathematics. It is important that pupils secure these key foundations of maths before being introduced to more difficult concepts.

This increased focus on number will allow pupils to explore the concepts in more detail and secure a deeper understanding. Key number skills are fed through the rest of the scheme so that students become increasingly fluent.

The intended impact of Maths teaching and learning at Pott Shrigley church school

Throughout each lesson formative assessment takes place and feedback is given to the children through verbal feedback, marking and next step tasks to ensure they are meeting the specific learning objective. Teacher's then use this assessment to influence their planning and ensure they are providing a mathematics curriculum that will allow each child to progress. The teaching of maths is also monitored on a termly basis through annual book scrutinies, learning walks and lesson observations. Each term children from Year 1 and above complete a summative assessment to help them to develop their testing approach and demonstrate their understanding of the topics covered. In order to complete this assessment we use the white rose maths assessment tools and tests.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. 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. We use the structure of our mixed age classes to ensure children are supported at whichever programme of study they are working at.

There is a detailed LTP available with clear progression for all year groups in a mixed age setting. This sets out end of year outcomes and objectives and details how each year group will be taught in a mixed age class.

Written – Spring 2024

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This policy will be renewed every three years or sooner if significant changes are made to the national curriculum.