ST. PETER'S PRIMARY SCHOOL
EVERYONE COUNTS

MATHEMATICS POLICY

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Intent

The intent of St Peter's mathematics curriculum is to design a curriculum, which is accessible to all and will maximise the development of every child's ability and academic achievement. We deliver lessons that are creative and engaging. We want children to make rich connections across mathematical ideas to develop fluency, mathematical reasoning, and competence in solving increasingly sophisticated problems. We intend for our pupils to be able to apply their mathematical knowledge to science and other subjects. We want children to realise that mathematics has been developed over centuries, providing the solution to some of history's most intriguing problems. We want them to know that it is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. As our pupils' progress, we intend for our pupils 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.

The National Curriculum for Mathematics aims to ensure that all pupils:

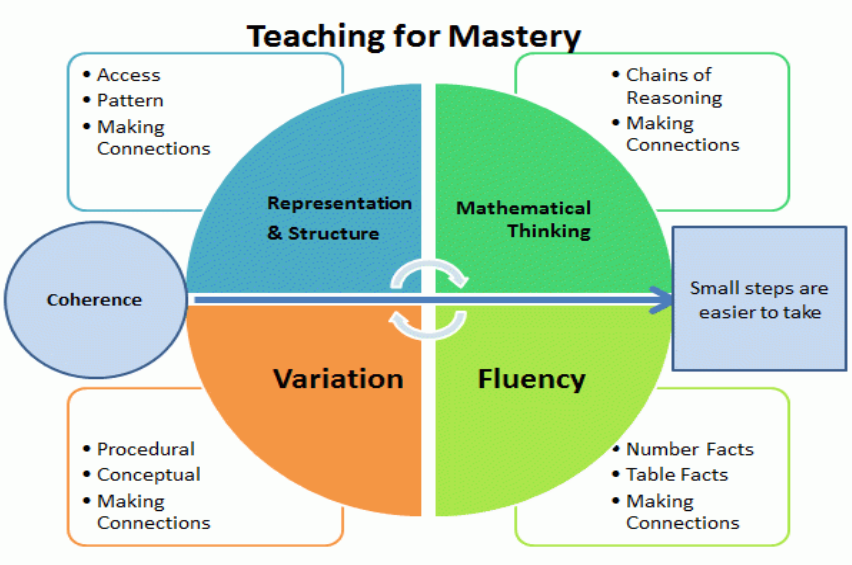
- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically by following a 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.

Implementation

All teachers follow a termly overview plan and are encouraged to design lessons using a range of resources, including, but not limited to, the White Rose Maths Scheme of Learning from the White Rose Maths Hub. A typical Maths lesson provides the opportunity for all children, regardless of their ability, to become confident and capable learners.

We are committed to building on prior learning and enabling our children to demonstrate a deep, conceptual understanding of each topic that they can develop over time. They are encouraged to develop fluency in their recall of key facts and a whole school approach to the teaching of calculation strategies is deployed across the school. This ensures a consistent and progressive approach and prepares our children for the upper key stage 2 curriculum.

Reasoning and problem-solving skills are explicitly taught to enable children to become independent learners who are prepared to take risks. Additional time is allocated to arithmetic to ensure key skills in calculation are retained. The teaching of multiplication facts continues to be a discrete focus, where the applications of these skills are essential for accessing other areas of mathematics. To make the learning relevant, cross-curricular links are made wherever possible and children are encouraged to apply skills from all areas to complete real-life challenges and give learning a sense of purpose.



At St Peter's we use the White Rose Scheme of Work and resources to cover the whole maths curriculum in a mastery style. Objects, pictures, words, numbers and symbols are everywhere. The mastery approach incorporates all of these to help children explore and demonstrate mathematical ideas, enrich their learning experience and deepen understanding. Together, these elements help cement knowledge so pupils truly understand what they have 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 – children have the opportunity to use concrete objects and manipulatives to help them understand and explain what they are doing.
Pictorial – children then build on this concrete approach by using pictorial representations, which can then be used to reason and solve problems.
Abstract – With the foundations firmly laid, children can move to an abstract approach using numbers and key concepts with confidence.

To provide adequate time for developing key skills in fluency, reasoning and problem solving, each class teacher will provide at least five daily mathematics lessons per week. This may vary in length but will usually last for about 45 to 60 minutes. Additional mathematics may be taught within other subject lessons when appropriate.

Class teachers provide high quality maths lessons ensuring that there is emphasis on direct whole-class teaching, groups/partner work and independent work. We use a range of approaches (concrete, pictorial and abstract methods) following the White Rose scheme of work, teaching mathematical concepts through small steps. Staff are expected to teach and model correct mathematical language, which scaffolds children's reasoning and explanation skills – sentence stems are used to develop this.

Maths in Early Years

The Early Years is a time for exploration and investigation in maths and the learning environment promotes mathematical thinking. Children develop their understanding through a rich variety of

activities both self-selected and adult led. Adults encourage the children to explore, enjoy, learn, practise and talk about their developing understanding which they can use to solve problems, generate questions and make connections across other areas of learning.

Impact

The impact of our Maths curriculum is that at the end of Key Stage 2 our pupils achieve and make progress in line with other pupils nationally, evident through:

- Fluency in their recall of key number facts and procedures.
- Accuracy in the formal calculation methods for all four operations.
- The flexibility and fluidity to move between different contexts and representations of mathematics.
- The ability to recognise relationships and make connections in mathematics.
- The confidence and resilience to reason mathematically and solve a range of problems.

Special Education Needs

Children with additional needs are supported by using practical resources and differentiated activities where needed. They are also further supported by additional support staff whenever possible. Where applicable, children's provision maps will incorporate suitable objectives from the National Curriculum or the EYFS curriculum and teachers keep these objectives in mind when planning work. In addition to quality first teaching, interventions also take place during the afternoons and focus on those children who may need more specific targeted input.

Assessment

Assessment is an integral part of the maths curriculum and not an addition to it. Children's work in mathematics is assessed from three aspects:

1) Informal, formative assessments are made continually by questioning the children, observing and monitoring their work. These short-term assessments are closely related to the learning objectives for the lesson and help inform next steps.
2) Periodic assessments take place at the end of a unit – we use White Rose Maths end of block assessments and Testbase to check progress and understanding of content covered. This information also informs interventions.
3) Summative assessment is less frequent - this is the use of tests or more formal assessments to find out what children have learnt. We use National Test-style (NTS) maths papers. Statutory Assessment Tests (SATs) are used for children in Year 2 and 6, plus children in Year 4 are also required to take a multiplication tables check (MTC) in the Summer Term. The purpose of the check is to determine whether pupils can fluently recall their times tables up to 12, which is essential for future success in mathematics.

A whole school tracking system is used to closely monitor children's progress throughout the school. Teacher assessments are entered half termly and are closely analysed to identify children working at greater depth or who are at risk, appropriate intervention is then put in place to close gaps.

Maths lessons at St Peter's School

What will you see in our maths lessons?	What does this look like?	Why is it important?
Micro-progression in weekly and daily planning	Tiny steps will be made in each lesson to develop a secure understanding. The small steps that were learnt in the previous lesson will be reviewed before moving on. Learning objectives are tight and reflect the new learning taking place in the lesson.	By breaking down concepts into tiny steps, children are more likely to be secure and confident. By grouping key concepts and patterns they will be able to make connections to other areas of maths and apply their skills to a range of problems.
Carefully planned questions	Specific questions will be planned into every lesson. A range of questions will be asked to develop children of all abilities and deepen the understanding of children working at greater depth.	Questioning allows children to think about what they are doing and why. They can then verbalise their answers. Differentiated questions will deepen the understanding of all abilities.
Children moving broadly at the same pace	Most children will be working on the same concept/pattern/area at the same time. Only children who are working significantly lower than age related expectations will work on other areas that will help them to be secure in basic number facts and concepts.	This allows all children to access the curriculum at the same time. It will stop gaps forming between slower and quicker graspers.
Mixed ability pairings	All children to work in mixed ability pairings that have been carefully planned. Adults will float between the tables to support and question children to deepen their understanding. If a child has been identified as having struggled in a previous lesson, an adult may support them. Tables are arranged so that all children can see the board, this improves the focus of the learners.	Children are very aware of ability groups. This can lead to low self-esteem. By mixing children, quicker graspers can develop their communication skills and ability to explain what they are learning and why. This also allows the slower graspers to have a good role model and the support of another child.
Ping-Pong style teaching	Ideas and activities regularly moving from teacher to children and back again. Planned mini plenaries will take place during independent tasks. The teacher will move around the room, checking the understanding of all pupils throughout the lesson allowing for instant feedback and formative assessment.	Children need to be engaged and take ownership of their learning. Through short tasks and discussions, children will work things out independently/in pairs rather than being told what to do by the teacher. The teacher is there to guide/focus the learning and support children to vocalise and record their ideas.

Procedural variation – Teaching specific concepts and patterns within a lesson	Children will be taught rules and patterns within areas of maths rather than just a technique to find an answer. *For example, knowing what happens to a number when multiplied by 10 and identifying/explaining the pattern.*	Children need to be able to identify patterns so that they can make connections to other problems and calculations. By understanding what happens to numbers, they can explain why patterns occur. They will then be able to spot mistakes and understand when they are wrong and why.
Conceptual variation – Using many different concrete and pictorial representations across all ages and abilities	All children may be using the same resource at the same time. Concrete resources are chosen carefully and are used purposefully to expose the structure of the mathematics. Visual representations are chosen to support the mathematical concept and moves the learning forward.	It is important to allow all learners to see concepts in a range of representations. They will help them to explain, make connections and see patterns. Some children can find it difficult to visualise concepts. This gives all children an opportunity to use visuals to support their understanding.
Layered tasks that gradually deepen a child's understanding by applying new concepts/skills. (This is rather than moving on to the next thing/bigger numbers)	Lessons are planned to build upon prior knowledge from the lesson before but also within the lesson. Independent tasks will be carefully planned to deepen children's understanding as they move through them. They will all be based on the same concept.	All children must show that they have grasped a new concept but this should be achieved through a range of problems. Through giving independent activities that gradually get more difficult in small steps, children can build upon what they already know and make connections. By planning questions that involve proving answers, spotting mistakes etc., children will be able to deepen their understanding.
Opportunities for greater depth throughout the lesson that can be accessed by all abilities	Greater depth should be planned into the whole lesson through different representations and carefully planned questions. Independent tasks should involve deep problem-solving tasks that can be accessed by any child that is secure with the concept being taught.	It is important to give all learners the opportunity to deepen their understanding. If they never have access, we will never know their real capabilities. This will help to develop confidence and self-esteem across all learners.
Using the correct maths vocabulary in full sentences	All children will be expected to understand and use the correct mathematical vocabulary when explaining their mathematical thinking. They will be expected to speak in full sentences when sharing an answer. Relevant maths vocabulary will be displayed in the classroom, on slides and in books.	If children know a range of specific mathematical vocabulary and words that are similar and relate, they will not be fazed when confronted with a new problem. If children speak in full sentences they are more likely to understand and explain why.
Emphasis on secure number facts	By the end of Year 1, most children will know number bonds within 20. By the end of Year 4, most children will know their times tables to 12 x 12. They will be able to apply these facts confidently during maths lessons.	If children are secure with number facts, they will not have to over complicate calculations by having to work out the number facts within them. Children will be able to focus on the concept/method/pattern rather than the number facts needed to know the answer.

Immediate intervention before the next session	Adults in lessons will quickly identify children who are struggling within a lesson. They will be supported straight away or given an opportunity to spend more time on the same area before the next or at the start of next lesson. If many children are not secure, teachers will address these immediately and adapt the planning for the next day.	By ensuring children have a secure understanding before they move on, gaps will not arise. Most children will be able to move on at broadly the same pace.