Maths Policy

At St. Paul's we teach for mastery and believe that fluency, reasoning and problem solving are at the core of all maths lessons, including maths across the curriculum. This approach begins from EYFS and extends throughout the school to year 6. Mastery of mathematics is something that we want pupils - all pupils - to acquire, or rather to continue acquiring throughout their school lives, and beyond. At St. Paul's, we believe that all pupils can achieve in mathematics! There is no such thing as a 'Maths person', that is the belief that some pupils can do maths and others cannot. A typical Maths lesson will provide the opportunity for all children, regardless of their ability, to work through Fluency, Reasoning and Problem Solving activities. The focus on mastery and growth mind-set learning in mathematics instils behaviours such as determination, respect, perseverance and resilience, all of which are part of our school value. Maths teaching for mastery rejects the idea that a large proportion of people 'just can't do maths'. At St. Paul's, all pupils are encouraged by the belief that by working hard at maths they can succeed.

Intent

Maths is a journey and long-term goal, achieved through exploration, clarification, practice and application over time. At St. Paul's learning in mathematics is defined as: The process of acquiring essential knowledge, skills, understanding and behaviours required for deep understanding and mastery of skills and content.

Mathematics provision is carefully designed to advance understanding gradually throughout a key stage. Lessons are not an event in themselves. They are part of the process of learning and therefore we do not expect children to complete all learning within a lesson. Many lessons will carry on over several days, weeks or even over a whole year until a pupil is demonstrating the required degree of understanding. Some aspects of the mathematics curriculum will be specifically taught during maths lessons whilst continuous provision will be used for other aspects, for instance 'time'. Sometimes continuous provision will be used to introduce concepts or skills, other times it is used to deepen them or secure retention of them. Effective provision and quality first teaching helps pupils, over time, to make progress and remember their learning - taking into account cognitive procedures and metacognition. Progress in mathematics is defined as the widening and deepening of essential knowledge, skills, understanding and behaviour. This means that pupils will use the same content repeatedly, each time in a richer and more challenging context, thus deepening their understanding.

We do not rush to introduce new content, as it is so important that pupils are provided with challenging opportunities, and have sophisticated problems that challenge them in a wide variety of different situations first. The time scale for progress is across a year or key stage, not in every lesson. Children are assessed according to curriculum standards for each year group. It is required that the vast majority of children will have the expected understanding/ mastery of the curriculum, and some will have a deeper understanding. Where children

have misconceptions / gaps causing them to be assessed as below expected, interventions will be provided to ensure children are able to keep up.

Aims

We aim to develop lively, enquiring minds encouraging pupils to become self-motivated, confident and capable in order to solve problems that will become an integral part of their future.

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 have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems

• can 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

The approach to the teaching of mathematics within the school is based on:-

• A mathematics lesson every day

• A clear focus on direct, instructional teaching and interactive oral work with both the whole class and smaller ability groups.

The curriculum is planned and delivered by teachers in a year group. Teachers will use a range of materials to support their medium and short term planning. Most notably, they will use White Rose materials to help sequence their learning but where appropriate other resources will be used. All work is differentiated in order to give appropriate levels of work.

Teachers will be aware of the National Curriculum and Programme of study which is outlined below.

Programme of Study Early Years Foundation Stage (EYFS):

In EYFS a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding – such as using manipulatives, including small pebbles and tens frames for organising counting – children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes. Children use their knowledge and skills in these areas to solve problems, generate new questions and make connections across other areas of learning and development. Children in the EYFS learn by playing and exploring, being active, and through creative and critical thinking which takes place both indoors and outside. We recognise that children learn through routine, continuous provision and incidental learning opportunities, as well as planned sessions and activities. Mathematical understanding can be developed through stories, songs, games, routine, questioning, imaginative play, child initiated learning and structured teaching. The ELGs should not be used as a curriculum or in any way to limit the wide variety of rich experiences that are crucial to child development. Instead, the ELGs should support teachers to make a holistic, best-fit judgement about a child's development, and their readiness for year 1

Programme of study for Key Stage 1 and 2

The Programmes of study for mathematics are set out year by year for Key Stages 1 and 2 in the new National Curriculum (2014). The programmes of study are organised in a distinct sequence and structured into separate domains. Pupils should make connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Key Stage 1

The principal focus of mathematics teaching in Key Stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources (e.g. concrete objects and measuring tools).

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a

range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money. By the end of Year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency. Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

Lower Key Stage 2

The principal focus of mathematics teaching in lower Key Stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number. By the end of Year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work. Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

Upper Key Stage 2

The principal focus of mathematics teaching in upper Key Stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio. At this stage, pupils should 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. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them. By the end of Year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages. Pupils should read, spell and pronounce mathematical vocabulary correctly.

Lesson Structure

At St. Paul's most lessons should include the following features:

- An engaging starter to revise previous learning and skills.
- Interactive whole class teaching to explore new concepts and ideas.
- A range of fluency, reasoning and problem solving
- Independent / group work to support development of new concepts and ideas.

We believe lessons should include a range of representations to ensure new content is understood. It is essential concrete, pictorial and abstract approaches are used. 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.

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 and drawings, 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.

Inclusion and equal opportunities

All children are provided with equal access to the mathematics curriculum. We aim to provide suitable learning opportunities regardless of gender, ethnicity or home background.

Entitlement

At St. Paul's, we teach mathematics to all children, whatever their ability or individual need. Through our mathematics teaching, we provide learning opportunities that enable all pupils to make good progress. Every child has an equal right to receive the maths curriculum in daily maths lessons of approximately one hour. There may be times when it is more appropriate for Foundation Stage or Key Stage 1 sessions to be approximately 45 minutes in length and for Key Stage 2 sessions to be over an hour.

Special Educational Needs

All children will have their specific needs met through differentiated work in conjunction with targets. TA support time is planned for and provided in relation to identified needs for individuals and groups.

Resources

All classrooms have a number of mathematical, age appropriate resources. Resources which are not used or required regularly are stored centrally and accessed by teachers at the beginning of a topic.

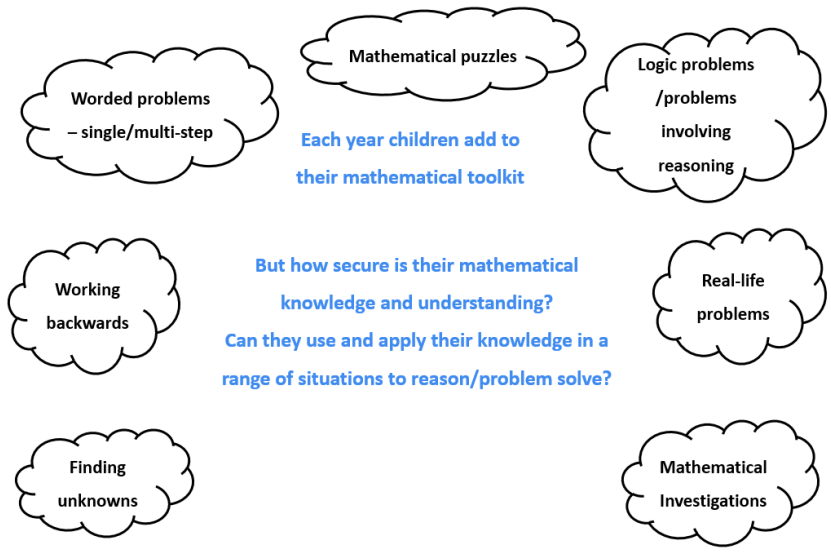
Displays

Each classroom should have a maths display relating to current work. The maths display should be presented to the pupils as a 'maths working wall' in classrooms from Reception to Year 6 and should be accessible to both teaching staff and the pupils and should be updated regularly to reflect pace of learning.

The display needs to include the following 4 sections as shown in the diagram below:

It should also include a problem solving prompt to support the focus on problem solving and reasoning:

Either on the working wall or in their planning folder, teachers must also have a copy of the document shown below:



Over the duration of a term it is important all these areas are explored to ensure children are developing a deeper understanding of concepts.

Assessment

For each year group there is a long term maths plan which outlines the objectives for the year. This document should be referred to when planning and assessing as it indicates the main objectives for the year as well as providing objectives for the year before and year after. Teachers should highlight this document regularly to ensure coverage.

After each lesson teachers should assess the understanding of the children and then use this assessment to plan the next step in learning.

Pupil Asset is used each term to update progress of the children. In order to make this judgement, staff will use their own judgement based on formative assessment but also judgements based on end of term tests.

Marking and presentation

Teachers are expected to adhere to the schools marking policy when marking books and presentation policy when guiding children as to how to present their work. It is particularly important the following are adhered to:

- 1 digit per square
- Margin with ruler down the side of each page. (2-3 squares)
- Date written on left after margin. Date written in digits in the format - 28.02.22

In some lessons children will mark their own work but this will still be checked by the class teachers. Pupils should also be provided with time to correct their misconceptions.

Monitoring and Evaluation

The Curriculum leaders, alongside SLT, are responsible for monitoring and evaluating curriculum progress. This is done through book scrutiny, planning scrutiny, lesson observations, pupil interviews, staff discussions and audit of resources.

Impact

By following the principles and aims of this policy, the impact is expected to be:

- Quick recall of facts and procedures.
- The flexibility and fluidity to move between different contexts and representations of mathematics.
- The ability to recognise relationships and make connections in mathematics.
- A mathematical concept or skill has been mastered when a child can show it in multiple ways, using the mathematical language to explain their ideas, and can independently apply the concept to new problems in unfamiliar situations.
- More children achieving ARE or GDS.
- Evidence of success and challenge evident in all work.

Most important we want children to develop a love of mathematical learning which will then ensure the children succeed in the next step of their education.