



Maths Policy

Policy created: November 2021

Agreed by Staff and Governors:

To be reviewed:

Rationale

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 (National Curriculum, 2014).

St. Peter's School strives to deliver meaningful maths which engages every learner in every lesson whilst ensuring that through appropriate support and challenge, learning is tailored to each and every child.

Maths in Key Stages 1 and 2 is a subject which involves confidence and competence in the areas of number, measurement, geometry and statistics. This Mathematics Policy values underpinning mathematical learning by providing a balance between conceptual understanding and procedural fluency in order to develop the children's arithmetic proficiency. It also promotes the ability to solve problems in a variety of mathematical contexts. To be secure in curriculum expectations, the children should demonstrate their understanding using a variety of manipulatives and models and be able to articulately explain their thinking whilst engaging in dialogic discussion.

We, as a school, recognise that these are fundamental necessities for children to be able to fulfil their potential in their academic lives and in society as a whole, allowing them to meet challenges equipped as numerate individuals. In primary education, we supply the foundations for everything that will follow.

Aims

As a school, we place great emphasis on the children learning as much as possible through their own first-hand experience, in order to properly understand and acquire their knowledge and skills. We strongly value offering the children opportunities to use models and images to support their thinking. This philosophy permeates everything about our teaching and how the children encounter mathematics in school.

Each child should be able to think and solve problems mathematically by using appropriate skills, manipulatives, concepts and knowledge. Children should be provided with rich and enjoyable experiences related to both individual needs and the wider requirements of society.

Through careful assessment, planning and preparation we aim to ensure that all children progress when they are ready. New knowledge and skills should be secured before new material is introduced. For those who grasp new material quickly, they should apply this to rich problem solving tasks.

We aim for the children to:

- Have a positive attitude to mathematics
- Have self confidence in their ability to deal with maths
- Be able to work systematically, cooperatively and with perseverance
- Be able to think logically and independently
- Experience a sense of achievement regardless of age or ability
- Understand the appropriate underlying skills, concepts and knowledge of number, measurement, geometry and statistics
- Effectively use manipulatives to support thinking, learning and understanding.
- Be able to apply previously acquired concepts, skills and knowledge and understanding to new situations both in and out of school.
- Be able to communicate with peers and adults, ideas, experiences, questions, clearly and fluently, using the appropriate mathematical vocabulary.
- Be aware of the use of mathematics beyond the classroom.

- Encourage the use of mental calculations and efficient strategies to work out solutions to enable them to develop procedural fluency alongside their conceptual understanding.
- Encourage 'Talk-rich maths' - full of thought and reasoning.

For Parents to:

- Be actively involved in their children's mathematical learning both in school and at home.

Growth Mindset

'Mindset change is about seeing things in a new way. When people change to a growth mindset, they change from a 'judge and be judged' framework to a 'learn and help learn' framework. Their commitment is to growth, and growth takes plenty of time, effort, and mutual support.' (Carol S. Dweck, Mindset: The New Psychology of Success.)

Learning a 'Growth Mindset' is the greatest opportunity we've ever had to change the way not only our children feel about themselves as learners, but the way our teachers feel about teaching maths. By changing the way we feel about maths, we open up to new ways of thinking and develop the resilience, curiosity and willingness to be challenged necessary to all great learning. At Suckley School we expect every child to succeed at maths.

Inclusion

The following principles inform and guide our policy and practise:

- meeting the diverse and complex needs of each and every individual is embedded in everything that we do as a whole staff
- it is the responsibility of the school to enable all children to access and make progress through the curriculum
- equal opportunities are not the same as equal provision.

Above all we celebrate and affirm the diversity in our school, our community, our society, and our world and commit ourselves to enabling all our pupils to participate constructively as they grow. For every child to be able to participate we must know each of them as individuals. For children with SEND, teaching must be closely linked to their Individual Provision Map (IPM) targets. What is good provision for a child with SEN is good for all children i.e. an abundance of activities that allow children to learn visually, through speaking and listening and kinesthetically.

We respond to children's diverse learning needs by:

- Creating effective learning environments
- Securing their motivation and concentration
- Providing equality of opportunity through a range of teaching approaches and modifying these for individual needs
- Using appropriate assessments
- Setting targets for learning
- Teaching more able children with their own class and extending their learning through differentiated group work, extra challenges and opportunities for independent learning.
- Where appropriate, special arrangements are made for an exceptionally gifted child e.g. they may be taught with children from a higher age range or may follow an individualised programme with more challenging problems to tackle.

Where there are barriers to learning

At St Peter's we have the highest expectations for all children. We act early to secure the essential knowledge and skills of the least able. In conjunction with the leadership team, notably the SENDCO and Maths Subject Leader, staff are encouraged to reflect on why these barriers exist in the first place, what can be done to prevent them arising in future. Where gaps need to be closed for individuals or groups, we run a programme of interventions in the afternoons. The

intervention used will depend on the nature of the difficulty for the child/ren. However, our principal interventions are the use of Numicon Kits at the appropriate level for addressing gaps in learning and the use of Dynamo which supports specific learning difficulties with maths, working memory and dyscalculia symptoms. The impact of these is monitored and regularly reviewed.

Mastery Curriculum

The Mathematics Mastery programme is a whole-school approach to teaching mathematics that aims to raise attainment for all pupils. The programme aims to deepen pupils' conceptual understanding of key mathematical concepts. Compared to traditional curricula, fewer topics are covered in more depth and greater emphasis is placed on problem solving and on encouraging mathematical thinking and dialogue.

We adhere to certain principles and features characterise the mastery approach:

- Teachers reinforce an expectation that all pupils are capable of achieving high standards in mathematics.
- The large majority of pupils progress through the curriculum content at the same pace. Differentiation is achieved by emphasising deep knowledge and through individual support and intervention.
- Teaching is underpinned by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge.
- Practice and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts in tandem.
- Teachers use precise questioning in class to test conceptual and procedural knowledge, and assess pupils regularly to identify those requiring intervention so that all pupils keep up.

The intention of these approaches is to provide all children with full access to the curriculum, enabling them to achieve confidence and competence – 'mastery' – in mathematics, rather than many failing to develop the maths skills they need for the future.

Therefore, mathematics at Suckley is taught at levels of gradually increasing difficulty. It is our belief that teaching this way leads to independent, confident children who are able to problem solve and apply their skills effectively.

The role of the teacher, therefore, should not be to teach information by rote learning, but instead to facilitate the learning process. This means that the teacher will design lessons that help children discover the relationship between bits of information. At Suckley School we know that as teachers we must give children the information they need, but without organizing for them. They are given opportunities to problem solve in most lessons and the opportunity to use the models and images they require to do this.

See also our Curriculum Statement and Calculation Policy

Planning

Teachers at school plan for deep coverage and mastery of the school's curriculum through both daily maths lessons and additional opportunities to develop mental maths skills as part of the curriculum.

Plans for daily maths lesson include mental maths practice, teaching, fluency, reasoning, and problem solving and cater for all learning styles. Children's individual targets are at the forefront of all planning and are clearly linked to and reviewed through regular assessments.

Lessons include:

- practical, hands on experiences
- Use of manipulatives and resources to help make abstract concepts concrete

- be rooted in problem solving
- encourage high quality maths dialogue, promoting reasoning
- a progressive range of calculation strategies to support and challenge all learners
- Learning without limits; children to pick their own level of challenge
- working with ICT

Planning must follow St Peter's Calculation Policy which gives an overview of the development of addition, subtraction, multiplication and division from Reception to Year 6. Teachers should use this detailed information on progression through each strand and how to use practical resources and models to develop understanding at each stage.

Lessons must be planned as part of a sequence of learning, which has meaningful outcomes for children. Mathematical skills must be rooted in problem solving, and real-life contexts to encourage purposeful teaching and learning.

Resources

White Rose Hub Mastery Resources

The White Rose Maths Hub have provided a long term curriculum plan that supports 'Teaching for Mastery'. Skills are revisited, and built upon, extending children's skills and thinking. There is termly mixed age planning for each year group from Year 1 to Year 6; each term is split into twelve weeks. A significant amount of time is devoted to developing key number concepts each year. This is to build their fluency as number sense will affect their success in other areas of mathematics. Students who are successful with number are much more confident mathematicians. The long-term plans ensure teachers stay in the required key stage and support the ideal of depth before breadth; ensure students have the opportunity to stay together as they work through the schemes as a whole group; provide plenty of time to build reasoning and problem solving elements into the curriculum.

Concrete – Pictorial – Abstract

At St Peter's we believe that all students, when introduced to a key new concept, should have the opportunity to build competency in this topic by taking this approach.

Concrete – students should have the opportunity to use concrete objects and manipulatives to help them understand 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.

The use of Numicon supports the children in this process. The Numicon shapes and patterns illustrate relationships and patterns of numbers and what we do with them, so clearly. The use of Numicon helps children to apply integrated thinking skills such as communicating mathematically, exploring relationships and generalising through problem solving. We have Numicon kits for all ages and abilities and these are utilised during interventions.

Alongside these key approaches which underpin our planning, we also use the NCETM mastery materials to provide further challenge, and problem solving opportunities for even the most able pupils. The NCETM resources are intended to assist our teachers in teaching and assessing for mastery of the curriculum. In particular they exemplify what depth looks like in terms of the types of mathematical tasks pupils are able to successfully complete and how some pupils can achieve even greater depth.

Resources used are

<https://nrich.maths.org/>

<http://www.ncetm.org>

Mental Maths

One of the three aims of the new curriculum states that pupils (of all ages, not just primary children) will '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. Just one of the ways in promoting mathematical fluency is to provide context for children to practice and consolidate the skills they have learnt. '

Children are given this opportunity daily, as part of **mental maths starters** to lessons. During this time the children must be given valuable feedback which addresses misconceptions as they arise. TT Rockstars is used to teach and reinforce the knowledge of times tables, all of which are expected to be achieved by the end of year 4.

All resources are all found on the shared maths folder for staff.

Assessment

All assessment is used to inform teaching and learning. We identify children's understanding and then swiftly scaffold and support learning, provide further challenge and reasoning opportunities, as well as providing focused interventions to overcome misconceptions.

At St Peter's we assess children in four main ways:

- Assessment for learning: continuous. This is recorded using the online tracker (FFT), regularly updating children's attainment against the NC Key Objectives.
- Marking: daily using **green** and **pink** for valuable feedback, including addressing misconceptions, identifying next steps and challenging mathematical thinking.
- End of unit and termly assessment of progress in mathematics to support teacher judgements using White Rose Maths assessments.
- Assessment and progress are monitored by the subject leaders using FFT which measures a child against Age Related Expectations (ARE). These are reported to the governing body.
- End of Key Stage assessments which are moderated with other schools.

Leadership/Role of the Coordinator

Our Maths Subject Leader must always be an outstanding practitioner in their own right in order to lead by example. To tackle barriers, ensure consistency and promote achievement for all pupils, they are responsible for:

- Monitoring teaching and learning through learning walks, book trawls, planning scrutiny and discussions with children
- Using the information gathered from data analysis to improve teaching and the curriculum.
- Robustly challenging teaching and staff confidence and identifying what support or development might be needed.
- Work with the SENDCO to timetable timely interventions and deploy support staff where necessary.
- Preparing and organising INSET as necessary for whole school CPD, keeping abreast of the newest initiatives in the teaching of mathematics.
- Work with the head teacher and governing body to continue to raise standards across our school.
- Maintaining the high profile of mathematics in the School Improvement Plan.
- To up-date maths resources regularly, including uploading documents to common.staff.