Mathematics Policy

"The only way to learn mathematics is to do mathematics." – Paul Halmos

Introduction

This policy outlines the teaching, organisation and management of the Mathematics at St John Bosco RC Primary School. This statement of policy relates to all pupils, staff, parents and governors of St John Bosco RC Primary School. Mathematics teaches us how to make sense of the world around us through developing a child's ability to calculate, reason and to solve problems. It enables children to understand and appreciate relationships and pattern both in number and space in their everyday lives. Through their growing knowledge and understanding, children learn to appreciate the contribution made by people to the development and application of mathematics. At St John Bosco, we seek to embed the enjoyment and challenge of mathematics in our children's learning.

Purpose and Aims:

The purpose of this policy is to describe our practice in Mathematics and the principles upon which this is based. 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.
- 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.

The Role of the Mathematics Subject Leader

Maths Leader- Mrs. Katy Collins

It is the responsibility of the Subject Leader to ensure that overall standards for Mathematics are good or better. This involves:

- Promoting up-to-date good practice by leading or arranging INSET and/or staff meetings in conjunction with the Senior Leadership Team.
- Monitoring standards, which involves; lesson observations, planning & work scrutiny, pupil interviews, moderation, learning walks and team teaching. This is carried out with the support of the Headteacher and link governor.
- Regular management time is allocated to undertake monitoring activities. Contributing to whole school planning activities and curriculum development.
- Providing support, guidance, coaching and mentoring of staff with the aim of improving their skills, knowledge and understanding of the teaching of mathematics.
- Deploying, directing, guiding and providing feedback about performance of Teaching Assistants/HLTAs and volunteers with the aim of maximising pupil progress.
- Analysing data and tracking and monitoring children's progress in Mathematics.
- Regularly updating an action plan for subject development across school, giving the Headteacher and governors an annual summary in which strengths and development points are evaluated and areas for further improvement are indicated.
- Ensuring that up-to-date knowledge of changes in the curriculum are cascaded to staff.
- Ensuring that resources in school match the needs of the children.
- Writing or updating policies in Mathematics.
- Liaising with the named member of the school's governing body to provide briefing of the teaching of Mathematics in school.
- Attending Maths Subject Leader's meeting and any additional CPD that will support the children's progress in Mathematics

Mastery approach to Mathematics

St John Bosco has adopted the Mastery approach to teaching and learning Mathematics.

Aims of mastery curriculum:

- Provide challenging learning opportunities for all which also allow more able pupils to develop a depth of learning before moving on to new skills.
- As part of curriculum planning, class teachers plan for children to master concepts and apply learning before moving children onto more difficult skills.
- Differentiation will be evident through the use of rich problem solving and reasoning activities and the opportunity to communicate reasoning using precise mathematical language.
- The implementation of the Concrete-Pictorial-Abstract approach (CPA) to teaching and learning to model and scaffold learning for all pupils, especially those working below age-related expectations and with SEN. This will support pupils to develop conceptual understanding alongside procedural fluency.
- The CPA approach is to be visible in all lessons. When first introducing a new concept, children are not shown abstract methods. The new concept is modelled using concrete resources and then visual representations. Children will only be taught abstract methods of recording and solving problems once they have a secure understanding of the concept.
- Provide opportunities to develop language and communication. Children deepen their understanding by explaining, creating problems, justifying and proving using mathematical language. Their use of language also acts as a scaffold for their thinking.
- Provide opportunities to develop mathematical thinking. Children deepen their understanding by asking and investigating questions, by giving examples, by sorting and comparing, or by looking for patterns and rules in the mathematics they are exploring.
- Provide opportunities to develop conceptual understanding. Children deepen their understanding by representing concepts using objects and pictures, making connections between different representations and considering what different representations stress and ignore.
- Provide children with the opportunities to polish and improve their work. This is achieved through response to making and feedback.

School Curriculum - Programme of Study

Foundation Stage

The programme of study for the Foundation stage is set out in the EYFS Framework. Mathematics involves providing children with opportunities to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe Shape, Spaces and Measures.

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 100 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.

Mathematics Planning

Planning is based upon the new National Curriculum Programmes of Study and should inform medium term plans and subsequently weekly planning. Class teachers are responsible for the relevant provision of their own classes and individually develop weekly plans which give details of learning objectives and appropriate differentiated activities. Although planned in advance they are adjusted on a daily basis to better suit the arising needs of a class and individual pupils.

Long Term Planning

- Class teachers are to use the Government Learning Objectives (National Curriculum) and the White Rose Hub Education documents.
- Teachers have the flexibility to adapt and change their planning to suit their class, keeping in mind statutory obligations of the National Curriculum.
- If class teachers need to plan from the previous year group, this should be stated on planning.
- In the EYFS teachers use the objectives set out in 'Development Matters' in conjunction with the statutory EYFS Framework.

Medium term Planning

- Class teachers are to use the year group specific White Rose Hub guidance as well the National Curriculum Objectives as a Medium Term Plan.
- Medium term Plans should be written half termly and take into account the information from assessments and the year group requirements already covered.

- Medium Term planning follows White Rose Hub teaching blocks as is organised into weeks which include the area of mathematics to be taught.

Short Term Planning

- Weekly lesson plans emanate directly from the medium term plans.
- All teachers use an agreed common format.
- All teachers and HLTA/ TAs evaluate their lesson plans after they have been used to create a reference point for the process of self-evaluation and self-improvement.
- Time is planned for all children to act upon the feedback provided by the teacher.

(See Planning proformas)

Cross curricular Maths

Throughout the whole curriculum, opportunities to extend and promote Mathematics should be sought. Maths skills are applied to other subject areas in creative curriculum sessions (for example, DT, Computing etc.) as well as in specific Maths/Science lessons. Maths skills applied in other subject areas, should match the year group curriculum and be pitched at the children's current ability.

Calculation Policy

The Calculation policy is in line with the new National Curriculum and reflects the integral use of CPA within the teaching and learning of mathematical concepts. The Calculation Policy is to be followed by all staff members. (See Calculation Policy)

Assessment

Assessment is used to help teachers, parents and children plan their next steps in learning. In Mathematics, we assess children against Small Step Objectives within the White Rose Hub blocks taught each term. These objectives are derived from the school programme of study and the National Curriculum.

- Assessment judgements are based on gathering evidence from using ongoing observations, records of work and testing.
- Year 1 to Year 6 use White Rose Hub termly Assessments as well as collecting and tracking APP evidence.
- On-going assessment is carried out by teachers both formally and informally during a unit of work. The results of these formative and summative assessments have a direct

impact on the teaching materials and strategies employed immediately following the assessment.

- To ensure that children have ownership of their next steps, success ladders (I cans) are used for each teaching block in Mathematics for each year group. (See Curriculum Overviews)
- Marking, questioning and feedback given by the teacher is carefully planned and recorded to ensure the child knows how to progress.
- Termly in-house moderation and Pupil Progress Meetings take place in Mathematics. Assessment judgements are moderated by colleagues in school to make sure our assessments are fair, reliable and valid.

Target setting

Children are set Maths termly targets. If children achieve their target before the start of a new term, new targets are to be written.

Key Stage 1

- One target relating to a Basic Maths skill.

Key Stage 2

- One target relating to a Basic Maths skill or one target linked to problem solving or reasoning.

- Children's targets are shared and explained to children.
- Targets are the focus of Pupil and Teacher meetings where progress is discussed.
- Targets are shared with parents/ carers and discussed at Parents Evenings.

Inclusion

St John Bosco RC Primary School provides an inclusive curriculum which will meet the needs of all children. All children have equal access to the curriculum regardless of gender, background, ethnicity or ability. This is monitored by analysing pupil performance throughout school to ensure that there is no disparity between groups. Children who are identified as having special educational needs will be supported through focused intervention and an SEN Support Plan will be put in place by the class teacher. These SEN Support Plans will be monitored by the SENCO. Our assessment process looks at a range of factors – classroom organisation, teaching materials, teaching style, resources or differentiation – so that we can take some additional or different action to enable the child to learn more effectively. Feedback is passed to the SENCO on a regular basis. Where ability groups are formed, care is taken to ensure decisions are made on grounds of mathematical ability. These groupings remain fluid and there is movement of children between the groups on a daily basis.

Additional Support

Some children will be identified as needing extra help and encouragement to make enough progress to remain at age-related expectations. These are not SEN children. These children will be part of an intervention group, identified by the Class Teacher and Maths Subject Leader. Appropriate intervention will be discussed and organised in a Pupil progress meeting held with the Maths Leader, SL Team and the class teacher. All recommendations are shared with any support staff who work with the children.

Gifted and Talented

All pupils have the right to follow a curriculum and receive teaching that is appropriate to their mathematical ability and their needs. Pupils who are Gifted and Talented in Mathematics are catered for in a range of different ways according to their age, ability and social needs.

Pupils at St John Bosco RC Primary who are considered to be Gifted & Talented in Mathematics are:

- At mastery/ Greater Depth understanding of the year group's curriculum.
- Able to solve a range of problems and puzzles.
- Able to make links between areas of maths and can transfer skills from different areas.
- Able to extrapolate from their current knowledge.
- Uninhibited in their use of mathematics.
- Open minded.
- Able to think laterally.
- Able to carry out calculations at speed.
- Able to do the above to a level significantly in excess of the majority of pupils in their mathematics teaching group.

Gifted and Talented pupils must not become isolated in mathematics. Any provision has to be able to include them as part of a group. The tasks that Gifted and Talented pupils carry out should be meaningful and enjoyable. The pupils should feel supported and catered for rather than that they are being given something to keep them quiet. Other pupils in the group must be allowed to achieve highly without feeling overshadowed by Gifted and Talented pupils in their class. Intervention is provided to ensure that all children achieve their full academic potential. This includes Gifted and Talented children. These pupils will be challenged through high expectations, appropriate tasks and opportunities to apply, explore and investigate maths. Homework activities will provide appropriate challenge. The most able pupils receive challenge through effective differentiation. They are encouraged to increase the breadth of learning by solving problems that extend their thinking whilst using learnt mathematical skills. They will be encouraged to develop problem solving and reasoning skills by using the Nrich materials.

(See Gifted and Talented Policy)

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. (See Marking Policy)

Resources

Resources which are not used or required regularly are stored centrally and accessed by teachers at the beginning of a topic. Each class has their own maths resources which differ from class to class, e.g. Numicon, place value counters, dienes equipment, number fans, place value cards, follow me cards, bead strings, multi-link, whiteboards etc.… It is the class teachers' responsibility to ensure children have access to the appropriate equipment for each lesson. Resources such as square grids and number lines are to be made by class teachers.

Homework

Homework in Mathematics is a valuable tool in promoting children's learning and allows the parents/ carers to be regularly involved in the child's mathematical development. It should not take the place of teaching a particular topic but should be used to consolidate work already covered at school e.g. the learning of a set of multiplication tables for homework should be preceded by coverage in class, where patterns and tips for remembering answers have been explored. The home learning should reinforce learning at school, not replace it. Particular care needs to be taken to ensure methods used at home reflect those taught in school. This may entail directing parents to the relevant pages of the Calculation Strategy Booklet to explain a particular procedure or worked examples being given at the beginning of the homework. Homework may focus on supporting the understanding of basic skills, e.g. learning number bonds, times tables. Practical activities which engage the child with everyday maths in their home environment are also encouraged, e.g. finding the capacity of various bowls from the cupboard. As children differ greatly in mathematical attainment, homework needs to be chosen carefully to stretch all learners, which may mean differentiated work. Tasks which are varied and interesting will motivate the children, stimulate their learning and foster a range of learning skills. Homework is set out in a separate book. There is an expectation that all homework is completed and handed in on time. Meetings with parents/carers will be arranged for any children frequently struggling to complete homework on time. All homework is marked by the class teacher.

Reporting to Parents/Parental Involvement

Parents are given the opportunity to discuss their child's progress at parent evenings held twice a year. The school operates an open door policy so if a parent has any queries throughout the year, they should arrange a meeting with the class teacher/Maths Subject Leader. We endeavor to keep parents informed of developments in Mathematics through:

- Curriculum Evening
- Parents Evenings
- SEN Review meetings
- Book observations
- Maths Information sessions/ Parental Maths Workshops
- Discussion of children's termly targets
- Posting developments/achievements on our school website
- Parent/ child curriculum days

"Education is not the learning of facts but the training of the mind to think." – Albert Einstein.