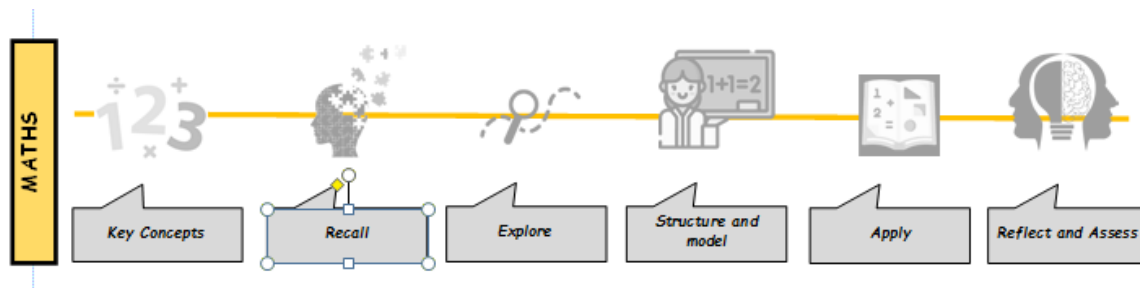




ST. JOHN BOSCO CATHOLIC PRIMARY SCHOOL

# Maths Across the School



Mathematics is important in everyday life and, with this in mind, the purpose of Mathematics at St. John Bosco Primary School is to develop an ability to solve problems, to reason, to think logically and to work systematically and accurately. All children are challenged and encouraged to excel in Maths. New mathematical concepts are introduced using a 'Concrete, Pictorial and Abstract' approach; enabling all children to experience hands-on learning when discovering new mathematical topics, allowing them to have clear models and images to aid their understanding. Arithmetic fluency and basic math skills are practised daily to ensure key mathematical concepts are embedded and children can recall this information to see the links between topics in Maths.

## Key Concepts

### 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 onto 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 concept 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 marking and feedback.

### **School Curriculum – Programme of Study**

- Basic Maths skills are taught daily. Memory joggers are used as a means of revisiting and ensuring key concepts from previous domains and years are embedded in long term memory. Memory joggers focus on key mathematical skills, for example place value, the four operations and fractions.
- A range of reasoning resources are used to challenge all children and give them the opportunity to reason with their understanding as part of daily maths lessons.
- Maths meetings and immediate interventions are used to support children to ensure children are ready for their next Maths lesson.
- Children are taught through targeted differentiated small group and mixed ability whole class lessons where a distinct structure of fluency, structure and modelling, applying and reflecting and assessing can be seen in each individual lesson and sequence of lessons.
- Lessons use a Concrete, Pictorial and Abstract approach to guide children through their understanding of mathematical processes.
- Revise and Review consolidation lessons for catch up intervention are used to revisit previous learning and ensure Maths skills are embedded.
- Homework is set to develop and review children's learning.
- Where possible, links are made with other subjects across the curriculum and applied outside maths lessons which support consolidation of learning.

### **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 involves working with numerals, words and the four operations, including with practical resources (e.g. concrete objects and measuring tools). At this stage pupils develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching also involves 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. In Year 1, pupils have a daily maths meeting centred around developing number fluency. This session is carried out using the Number Sense approach and resources. In Year 2 Number Sense is used to further support learners in developing fluency within number and is used to support pupils who are working below age related expectations.

### **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. Pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, pupils develop their ability to solve a range of problems, including those involving simple fractions and decimal place value. Teaching also ensures that pupils draw, with increasing accuracy, and develop mathematical reasoning so they can analyse shape and their properties, and confidently describe the relationships between them. Pupils learn to 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 develops the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio. At this stage, pupils 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 consolidates and extends 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.

## Recall

Basic Maths skills are taught daily. Memory Joggers are used as a means of revisiting and ensuring key concepts from previous domains and years are embedded in long term memory. Memory joggers focus on key mathematical skills, for example place value, the four operations and fractions. They support children in knowing and remembering more.

## Explore

The children are introduced to the key concepts and generalisation. Each lesson begins with a number of fluency tasks or problems relating to the maths skills required to understand the key mathematical concept and domain of the lesson. Children often work in groups using concrete materials to solve the

problems. The teacher then leads a discussion, using questioning to challenge and move learning forward and introduce the generalisation (objective) of the lesson.

## Structure and Model

Once the concept has been introduced, an 'I do' 'You do' approach is taken, where a guided example is carefully scaffolded and completed together with the pupils and teacher. Lessons use a Concrete, Pictorial and Abstract approach to guide children through their understanding of mathematical processes. These are progressive throughout school and allow pupils to build independent skills that allow them to reason and problem solve confidently. As part of this whole class teaching the children should all be given the same questions to look at. Differentiation comes in the way they are supported and the methods they use for calculation and solving. For example, the use of SPA. This ensures we are not limiting any children in their learning by putting them into a category/ability group. This part of the lesson uses small steps and the modelling from the teacher is key here.

## Apply

This is a chance to practice and apply the skills taught. Varied fluency tasks with small changes are given first. The children should be exposed to lots of different representations as part of the fluency teaching here and then move onto modelled reasoning quickly using the same approach. All children should move quickly from fluency to reasoning in the same lesson unless major misconceptions have been identified (this will be reflected in marking and evaluations). Reasoning is planned for and incorporated into every session. During this time teachers will stop, do mini-plenaries, clarify misconceptions, offer immediate intervention and extension if needed.

## Reflect and Assess

The session is drawn to a close by reviewing the key objective/generalisation. This can be done by looking at a challenge together or allowing children to come and model what they did during the session. Reasoning and problem solving is further developed in this stage. Look at the problem, break it down. Apply what you know and identify what you don't.