



# Mathematics Policy

## 2015-16

## **PURPOSE OF STUDY**

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 in England – Mathematics Programme of Study – Key Stages 1 and 2)

## **AIMS**

Based on the national curriculum for mathematics, the aims for successful mathematics provision at St Mary's Catholic Primary School is 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 generalizations, 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;
- acquire the necessary skills and fluency to recognize and make links between areas of mathematics and to move between representations of mathematical ideas;
- apply their mathematical knowledge to science and other subjects.

## **THE PROVISION OF MATHEMATICS**

At St Mary's Catholic Primary School we:

- use the National Curriculum and the Statutory Framework for the Early Years Foundation Stage as our programmes of study and follow the statements outlined in these documentations to ensure full coverage for teaching and learning and to ensure that children achieve or exceed their age-related expectations. The school ensures that there are a variety of resources to supplement these, which are stored in the maths area or in classrooms;
- have adopted the Mathematics Mastery programme for the delivery of mathematics lessons in EYFS, Year 1 and Year 2 which is taught daily for one hour. This programme will be introduced to Year 3 in September 2016, to Year 4 in September 2017 and so-on so that eventually it will be taught in every year group throughout the school.
- teach a dedicated daily mathematics lesson, which includes a mental oral starter activity; main teaching input; children's independent task and plenary session (KS2 – Years 3 –6)
- revisit and practice areas of mathematical learning through mathematics meetings in EYFS and KS1.

## **TEACHING AND LEARNING STRATEGIES**

The expectation is that the majority of pupils will move through the programmes of study provided by the National Curriculum at broadly the same pace. However decisions about when to progress are based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly are challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material consolidate their understanding, through additional practice, before moving on. All lessons therefore are appropriately differentiated to fully meet the needs of all pupils in class. Teachers employ a range of teaching strategies, which include:

**Directing:** sharing teaching objectives with the class, ensuring that pupils know what they are going to learn;

**Providing multiple concrete and pictorial representations:** a key part of a 'deep understanding' in maths is being able to represent ideas in lots of different ways.

**Instructing and demonstrating:** modeling mathematics using appropriate resources and visual displays through the use of:

- Early years: adult led activities
- KS1 and 2: process based 'steps for success'
- Use of ICT where appropriate.

**Developing pupils' use of mathematical language to communicate their ideas:** When pupils are asked to explain, justify and prove their ideas they are deepening their understanding of a concept. Pupils are expected to give their answers in full sentences using the correct vocabulary. This is modelled for them within the lesson.

**Explaining and illustrating:** giving accurate, well-paced explanations and referring to previous work or methods using visual and concrete representations (in keeping with Mathematics Mastery principles).

**Questioning and discussing:** questioning in ways, which match the direction and pace of the lesson and ensure that all pupils take part; using a range of questioning, particularly open questions, to encourage pupils to explain their mathematical ideas and thinking process using accurate mathematical vocabulary;

**Using assessment for learning to evaluate pupils' responses:** identifying misconceptions while pupils provide answers to questions on mini-whiteboards and while working independently on given tasks. Teachers use this as an opportunity for valuable teaching points, giving oral feedback, discussing and sharing pupils' chosen methods and responses;

**Consolidating and practicing:** maximizing opportunities to reinforce, consolidate and practise what has been taught; provide opportunities to work collaboratively as well as independently in a variety of ways: practical, oral and written

**Guided group work:** using lesson time effectively to enable the teacher and teaching assistant to work collaboratively and focus teaching on particular groups at a time while others work independently on tasks set. This is to ensure that all pupils are challenged appropriately and progress at a rapid pace;

**Summarizing (plenary and mini-plenary):** reviewing, during and towards the end of the lesson, what pupils have learned and how they overcome difficulties they might have encountered.

**Use of CPA model: Concrete-Pictorial-Abstract:** Instead of learning mathematical procedures by rote, we want pupils to build a deep conceptual understanding of concepts which will enable them to apply their learning in different situations. As a Mathematics Mastery school, we adopt the approach that children need to use concrete materials and have pictorial representations to develop a strong understanding of mathematics, before they are ready to understand abstract representations.

**Problem solving:** providing lots of opportunities for pupils to investigate planned open questions that require them to sort and compare, seek patterns and look for rules.

## **PLANNING**

### **EYFS**

Within the Foundation Stage, Nursery and Reception classes follow the Mathematics Mastery programme which meets the requirements of the Statutory Framework for EYFS 2014. Practitioners take into consideration children's learning characteristics and interest to provide a broad and balanced curriculum.

### **KS1**

In KS1, the Mathematics Mastery programme is followed, and this is fully in line with teaching and learning expectations outlined in the National Curriculum Programmes of Study 2014. Weekly plans provide detailed outline of lessons, which follow a six part lesson using the principles of the Mathematics Mastery programme. The plan outlines the teaching methods to be used during the lesson as well as differentiated activities for all groups of children in the class.

### **KS2**

In KS2, teachers plan three part lessons, which have a mental oral starter, a main teaching input and the opportunity for children to work independently or in groups on work set by the teacher. This is followed by a plenary session which re-visits what has been learnt during the lesson and moves learning on further by providing a question that allows children to use and apply their newly gained skills. Teachers plan the lessons with their year group partners to ensure parity. The teachers are guided in their planning by the objectives set out in the National Curriculum Programmes of Study 2014.

### **DISPLAYS:**

Learning wall displays complement the teaching and learning of mathematics by having up to date visuals and explanations of what is being taught in the lesson. Displays support the teaching of mathematics and may include key vocabulary, success criteria, visual imagery to aid understanding and examples of outstanding pieces of work from selected children if appropriate.

### **HOMEWORK:**

Homework setting is an integral part of mathematics teaching at St Mary's. This is sometimes a set of questions to answer and sometimes may be an exercise set on the MyMaths website. Through completion of homework children are given the opportunity to practise and consolidate mathematical skills and knowledge learnt at school. Furthermore, it provides information to parents about what area of mathematics their child is learning at the time.

The aim of the homework is to provide children with the opportunity to practise new skills learnt in the day and consolidate knowledge. Through regular practice, children improve their ability to problem solve becoming better at making links with all areas of mathematics and they pick up new ideas quickly in order to move on more readily to the next steps of learning.

## **ASSESSMENT**

Assessment is related to the Schools' Mission in that we value each child and provide opportunities for them to fulfill their true potential. Assessment is an integral part of teaching and learning. The purpose of Assessment for Learning is to find out how well the whole class, groups and individual children have learnt and progressed in the lesson and what they have achieved based on what they can or cannot do. Assessment helps teachers to plan the next steps in teaching and learning so that effective progression may take place.

### **Formative Assessment**

Teachers are constantly assessing children's knowledge, skills and understanding during the lesson. Through direct teaching and discussion, children are given oral feedback to help with putting right their misconceptions. Teachers use 'diagnostic marking' to further identify misconceptions or to provide next steps to challenge those who achieved well. Children are given the opportunity to respond to teacher comments and complete challenge questions set in order to make improvements or extend their knowledge, skills and understanding. Formative Assessment is an ongoing process, which enables teachers to adjust day-to-day lesson plans and deploy support staff effectively to assist children as and when needed. These daily assessments help with the next steps in teaching and learning.

### **Summative Assessment**

- The school uses a variety of formal summative assessments.
- The Nursery and Reception Classes use the 'Development Matters' documentation to provide integrated or discreet teaching and learning opportunities throughout the year to ensure that children make progress and achieve the Early Learning Goals. At the end of the academic year, children are judged as to whether they met or exceeded the Early Learning Goals.
- In Years 1 to 6, teachers use Rising Stars assessment tests termly to support their judgements about children's understanding in relation to the new mathematics curriculum. Alongside of this, teachers use target sheets and marking of children's work to measure how well children achieve the learning objectives set in the mathematics lesson.
- In Year 2, pupils will undertake statutory KS1 assessment tasks which will inform the teacher's judgement of whether the child is working in line with, below or above the expectations for Year 2. This teacher judgement will be reported to the Department for Education.

In Year 6, children sit the KS2 Mathematics tests (one arithmetic paper and two reasoning papers) in the summer term, which get sent off to be marked externally. The results of that will give a scaled score and will indicate if a child is working in line with, above or below the standard expected for Year 6.

The result of these tests and assessments are used to track pupils' progress throughout the Key Stages, year on year. At the end of the academic year, parents receive an annual report, which informs them of their child's progress

- In-school tracking of progress: levels of achievement are updated at the end of each term and are recorded on a database used by the school to identify pupils who are:
  - making less than expected progress
  - making expected progress
  - exceeding expected progress

This information is used by the school to set up intervention / booster groups in mathematics to ensure that all pupils meet or exceed their expected target.

## **ENTITLEMENT TO THE MATHEMATICS CURRICULUM**

### **Equal Opportunities**

All pupils at St Mary's Catholic Primary will have full access to the Mathematics curriculum regardless of gender, race, cultural background or any physical or sensory disability. The mathematics curriculum will be differentiated to provide appropriately for all children. Special Educational Needs Pupils with S.E.N., including gifted and talented pupils, are involved in all work planned at the level appropriate to the needs of the children in order to help them achieve their full potential. All weekly plans will show differentiated teaching and learning activities. These are planned to match the child's ability and where necessary take regard of the pupil's I.E.P.

## **MONITORING AND EVALUATING THE MATHEMATICS CURRICULUM**

### **Aim**

To ensure high standards are maintained and targets reached.

### **Practice**

- Book scrutiny, which focuses on the following areas:
  - Layout of work is neat and amount of work completed is sufficient, regardless of the child's ability;
  - Marking policy is applied consistently;
  - Diagnostic marking and learning conversations take place as appropriate;
  - Learning journey is evident;
  - There is sufficient evidence of children making rapid and sustained progress through the year;
- Planning scrutiny focusing on sufficient coverage of areas in mathematics and in line with the expectations outlined in the Programmes of Study for Mathematics in the National Curriculum 2014;
- Mathematics co-ordinator to: to carry out lesson observation learning walks with other members of the SMT and SLT team and grade lessons according to Ofsted guidelines;
- to monitor the quality of mathematics displays so that they are in line with the school's agreed expectations;
- to carry out pupil-conferencing to take into account pupils' view of mathematics provision in the school and act upon it;
- to work closely with SMT and SLT members and carry out data analysis of pupil achievement and progress across the three key stages;
- Work in close liaison with Mathematics Governor and ensure that there is involvement in all of the above.