Rivington Primary School



Mathematics Policy

Reviewed July 2015

**Introduction**

This policy outlines the teaching, organisation and management of mathematics taught and learnt at Rivington Primary. The policy is based on the 2014 expectations and aims of the ‘New Curriculum’ for mathematics and the Early Years ‘Development Matters’ EYFS document. This ensures continuity and progression in the learning and teaching of mathematics.

**Purpose**

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.

**Aims**

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 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 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.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils’ understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

**Information and communication technology (ICT)**

Calculators should not be used as a substitute for good written and mental arithmetic. They should therefore only be introduced near the end of key stage 2 to support pupils’ conceptual understanding and exploration of more complex number problems, if written and mental arithmetic are secure. Teachers should use their judgement about when ICT tools should be used.

**Spoken language**

The national curriculum for mathematics reflects the importance of spoken language in pupils’ development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. They must be assisted in making their thinking clear to themselves as well as others and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

**Early Years**

Work undertaken within the Foundation Stage is guided by the requirements and recommendations set out in the Early Years ‘Development Matters’ EYFS document. All children are given ample opportunity to develop their understanding of mathematics through varied activities that allow them to use, enjoy, explore, practise and talk confidently about mathematics.

**School curriculum**

The programmes of study for mathematics are set out year-by-year for key stages 1 and 2 with the National Curriculum. Schools are, however, only required to teach the relevant programme of study by the end of the key stage. Within each key stage, schools therefore have the flexibility to introduce content earlier or later than set out in the programme of study. In addition, schools can introduce key stage content during an earlier key stage, if appropriate. **All schools are also required to set out their school curriculum for mathematics on a year-by-year basis and make this information available online. (See Progression Maps for each domain)**

**Attainment targets**

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 – Years 1 and 2**

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 [for example, 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 and within 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.

**Lower Key Stage 2 – Years 3 and 4**

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 – Years 5 and 6**

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.

***We are aware that there will be a period of catch-up with the gaps in our pupils’ pre-requisite knowledge because of the demands of the previous National Curriculum for mathematics.***

**Planning, learning and teaching (A typical lesson)**

We are currently trialling the ‘Singapore Method’ of teaching mathematics, delivery having begun in Years 1-3 in Spring 2015 and Years 4-6 due to join the trial in Autumn 2015.

Lesson structure is based around 6 elements of effective mathematics teaching:

1. Exploration – talking about the problem which provides the ‘hook’ for the lesson.

2. Structured learning – sharing and evaluation of different methods taken from the children but carefully selected by the teacher.

3. Journaling – the opportunity to document one’s thinking.

4. Reflection – considering other approaches. Initially teacher led but should become more pupil led over the course of the year.

5. Practice – focus on the careful selection of numbers to increase challenge and support children’s progress.

6. Application – should include challenge for children to demonstrate number sense or computation speed.

Where appropriate mental maths will take place as separate session.

**Progression of Calculation Methods**

We have a policy for progression in calculation methods to ensure continuity and consistency throughout the school ( see Calculation Policy).

**Differentiation and support (Including provision for SEN, G&T and PP pupils)**

This is incorporated into all mathematics lessons and is done in various ways, for all pupils including those who are lower and higher achieving:

* Setting appropriately challenging tasks based on systematic, accurate assessment of pupils’ prior skills, knowledge and understanding.
* Timely support and intervention; systematically and effectively checking pupils’ understanding throughout lessons.
* Ensuring that marking and constructive feedback is frequent and of a consistently high quality enabling pupils to understand how to improve their work; children must be given time to respond to feedback.
* Open ended activities/investigations where differentiation is by outcome.
* Providing a variety of resources depending on abilities eg: Counters, cubes, 100 squares, number lines, mirrors.
* Support from teacher or TA in class, annotated on planning.
* Setting appropriate and regular homework.
* IEPs are implemented for those children who need them and are reviewed termly.
* Intervention programmes/extra teacher support delivered where needed both in class and through additional sessions delivered outside lesson time.
* Year 6 higher attainer group.

**Marking**

The main purpose of our marking policy is to give children consistency in their learning – to ensure that as children progress through school they benefit from the feedback they are given through constructive guidance about how to improve.

*See Marking Policy*

**Monitoring and Assessment**

Assessment is regarded as an integral part of teaching and learning and is a continuous process. It is the responsibility of the class teacher to assess all pupils in their class. This is mainly achieved through mini-plenaries, questioning, marking, TA feedback and pupil self-assessment.

Criteria achieved are highlighted and dated on the Progression Maps within each child’s mathematics book.

More formal assessments are carried out each term followed by pupil progress meetings held termly to discuss pupils’ individual attainment and progress towards end of term targets, as well as the attainment and progress of subgroups such as: boys, girls, SEN and those in receipt of the Pupil Premium funding. These assessments are recorded electronically by highlighting progression maps for each child and completing a class summary. In Key Stage meetings action is agreed to support learners who are not on target to reach their end of term target level. This may include involvement in intervention groups or the need for outside specialist support.

Year 2 and Year 6 complete the national SATs for mathematics in the summer term. Years 3, 4 and 5 also complete the optional tests to support teacher assessments.

At the annual transition meeting staff are made aware of each learner’s current attainment based on the end of year’s assessment. At the start of the academic year this data is used by class teachers to set challenging individual targets which are then shared and agreed with the Senior Leadership Team.

At the end of each term staff are expected to provide the Headteacher with each of their learner’s attainment in numeracy.

**Reporting to Parents**

* Parents receive an annual report indicating pupils’ achievement at the end of the Summer term.
* Parents invited to discuss their child’s work with teachers each term with the formal consultation evening taking place during the Spring term.
* At the end of the school year, parents of our Reception children receive their child’s Foundation Stage Progress and Parents of Year 2 and 6 pupils receive their child’s SATs results.

**Homework**

It is our school policy to provide parents and carers with opportunities to work with their children at home. These activities may only be brief, but are valuable in promoting children’s learning in mathematics. Activities are sent home on a regular basis and take the form of number games and tasks with some formal exercises for older children. A homework activity is provided through each class page on the school website.

**Continuing Professional Development**

The subject leader for mathematics attends ‘subject leader’ training each term and feedbacks to staff at planned staff meetings following the training. Through performance management staff have the opportunity to identify areas of need and appropriate training is arranged. Staff meetings also provide staff information and training such as the use of visual representations and manipulatives and the importance of reasoning language.

**Governance**

We have an identified numeracy governor. They liaise with the subject leader, keep the whole governing body updated and monitor standards throughout the school by supporting and challenging the co-ordinator.