Rhodes Avenue Primary School

Mathematics Policy
Summer
2022

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PRIMARY SCHOOL

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Context

Mathematics is a creative and highly inter-connected discipline. It is essential to everyday life, critical to science, technology and engineering, finance, literacy and a prerequisite for most forms of employment. At Rhodes, our aim is to create resilient and inspired Mathematicians who have the necessary tools to solve problems and communicate mathematically. Our children should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems.

Aims

The school's aims are for pupils to:

- develop their numeracy and mathematical reasoning in all subjects so that they understand and appreciate the importance of mathematics;
- become **fluent** in the fundamentals of mathematics by:
    - recalling and applying mathematical knowledge rapidly and accurately;
    - varied and frequent practice with increasingly complex problems over time.
- **reason mathematically** by:
    - following a line of enquiry;
    - generalising and developing mathematical arguments;
    - providing justification/proof using mathematical language.
- **solve problems** by:
    - breaking down problems into a series of simpler steps;
    - persevere in seeking solutions;
    - applying their mathematics to a variety of routine and non-routine; problems with increasing sophistication.

Consequently progress in mathematical learning each year will be assessed according to the extent to which pupils are gaining a deep understanding of the content taught resulting in sustainable knowledge and skills. Key measures of this are the abilities to **reason mathematically** and to **solve** increasingly complex **problems**, doing so with **fluency**.

The Mathematics Curriculum

The programmes of study for mathematics are set out year by year for Key Stages 1 and 2. The school is required to teach the relevant programme of study by the end of the key stage. The *National Curriculum in England* (September 2013) states that the expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. Decisions about when to progress will 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 rich and sophisticated problems before any acceleration through to new content. Pupils who are not sufficiently fluent with earlier material should consolidate their understanding before moving on.

By the end of each key stage, pupils are expected to know, apply and understand the content, skills and processes specified in the relevant programme of study.

Statutory Requirements of the Mathematics Curriculum

EYFS

Within the EYFS, Mathematics falls under the specific area and has two Early Learning Goals:

- Number
- Numerical Patterns

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/974907/EYFS_framework_-_March_2021.pdf

Transition between EYFS and KS1

Mathematics is explored using a continuous provision approach. The children explore new concepts and skills in the outdoor area as well as revisiting any aspects of the EYFS curriculum. Children are encouraged to engage in active maths lessons whilst also challenging themselves daily. Children complete weekly 1:1 activities with the class teacher appropriate to their ability whilst also accessing the continuous provision daily. EYFS concepts are revisited using songs, rhymes and concrete resources.

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 [for example, concrete objects and measuring tools].

At this key 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 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 1.

Year 1 programme of study

- **Number**
  - number and place value;

- addition and subtraction;
- multiplication and division;
- fractions.

- **Measurement**

- **Geometry**
  - properties of shape;
  - position and direction.

Year 2 programme of study

- **Number**
  - number and place value;
  - addition and subtraction;
  - multiplication and division;
  - fractions.

- **Measurement**

- **Geometry**
  - properties of shape;
  - position and direction.

- **Statistics**

Key Stage 2

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.

Year 3 programme of study

- **Number**
  - number and place value;
  - addition and subtraction;
  - multiplication and division;
  - fractions.

- **Measurement**

- **Geometry**

- properties of shape.

- **Statistics**

Year 4 programme of study

- **Number**
  - number and place value;
  - addition and subtraction;
  - multiplication and division;
  - fractions (including decimals).

- **Measurement**

- **Geometry**
  - properties of shape;
  - position and direction.

- **Statistics**

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.

Year 5 programme of study

- **Number**
  - number and place value;
  - addition and subtraction;
  - multiplication and division;
  - fractions (including decimals and percentages).

- **Measurement**

- **Geometry**
  - properties of shape;
  - position and direction.

- **Statistics**

Year 6 programme of study

- **Number**

    - number and place value;
    - addition, subtraction, multiplication and division;
    - fractions (including decimals and percentages).

- **Ratio and Proportion**

- **Algebra**

- **Measurement**

- **Geometry**
    - properties of shape;
    - position and direction.

- **Statistics**

https://www.gov.uk/government/publications/national-curriculum-in-england-mathematics-programmes-of-study/national-curriculum-in-england-mathematics-programmes-of-study

Mathematics Planning

Rhodes Avenue does not follow one scheme of work. As a school, we use our Maths Overviews, Progression Maps and Knowledge and Skills maps to ensure our Mathematics Curriculum is progressive and covers the entire Mathematics Curriculum. We draw on a range of resources that allows us to meet the needs of ALL children and provide challenge.

Mathematical Enrichment

The Development of Mastery and Greater Depth Mathematics

What the school means by '*Mastery*' is pupils having a deeper understanding of mathematics. This is achieved through a programme of enrichment activities, teaching a set of pedagogic practices that keep the class working together on the same topic, whilst at the same time addressing the need for all pupils to master the curriculum. More time is spent on teaching areas of mathematics that allow for the development of depth with sufficient practice to embed learning.

Pupils benefit far more from enrichment and a deepening of age-expected content rather than accelerating into a higher age group content which is likely to promote superficial understanding, rather than a true depth of knowledge, which is the foundation of higher mathematics.

The school aspires for all pupils to develop depth in their learning and some pupils will go deeper still in their learning and we refer to this greater understanding as mastery with greater depth.

Mastery of the curriculum requires that pupils:

- Use mathematical concepts, facts and procedures appropriately, flexibly and fluently;
- recall number facts with speed and accuracy and use them to calculate and work out known facts;
- have sufficient depth of knowledge and understanding to reason and explain mathematical concepts and use them to solve problems.

Mastery at greater depth is characterised by pupils' ability to:

- solve problems of greater complexity, where solutions are not immediately obvious and require imagination and creativity;
- independently explores and investigates mathematical contexts and structures;
- communicates results clearly and systematically explain and generalise the mathematics.

Mastery of mathematics is not a fixed state but a continuum. At each stage of learning, pupils should acquire and demonstrate sufficient grasp of the mathematics relevant to their year group, so that their learning is sustainable over time and can be built upon in subsequent years.

Assessment

At Rhodes Avenue there is a number of approaches used to assess Mathematics across the school. Within the EYFS, Early Learning Goals are used to assess mathematical areas at the end of Reception. National statutory assessments are taken at the end of KS1 and KS2. NFER assessment materials are used to assess progress on a termly basis to support teacher assessment which is entered on Target tracker three times a year.
Sandwell Maths are administered by SENDCOs to provide a more detailed analysis for targeted children.

Spoken Language

The national curriculum for mathematics reflects the importance of spoken language in pupils' development across the 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. Pupils will be encouraged to make their thinking clear to themselves as well as teachers and peers to ensure that they build a secure foundation and teachers whenever possible find opportunities for mathematical discussion to probe and remedy any pupil misconception.

Assessment

Refer to the Assessment Policy.

Equal Opportunities

Equal access to the Mathematics curriculum is given to all children regardless of ability, gender, culture, religious or ethnic origin. Rhodes Avenue complies with its duties under the Equality Act 2010 and all staff will have due regard to the need to eliminate discrimination, harassment, victimisation and any other conduct that is prohibited by or under the abovementioned Act. The school celebrates diversity and encourages inclusion.

Procedure for policy monitoring and dissemination

All members of staff will receive a copy of this policy. Copies are available on the school's website and hard copies can be collected from the school office on request. This policy has been approved by the Governing Body. It will be reviewed in line with the school's policy schedule.

Persons Responsible

Headteacher
Mathematics Leader
Senior Leadership
Team
Curriculum Sub-Committee