



# Mathematics Policy

Reviewed:  
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## **AIMS**

In line with the National Curriculum, at Ryhill Junior, Infant and Nursery School, we aim to develop pupils' mathematical fluency. We place learners at the heart and are driven by the school's vision statement: "Together we can achieve" Our intent is to provide our learners with a curriculum that is coherent, well - structured and progressive, based around high quality teaching that allows our children to acquire good subject knowledge and understanding of key concepts, application of skills and development of ambitious vocabulary.

In Mathematics, developing pupils understanding and quick recall of key facts and information is a priority, as well as enabling them to use, apply and make links between these different ideas, enabling them to become fluent in the language of mathematics. This is all underpinned by the Five Strands of Mathematical Proficiency:

1. Conceptual Understanding
2. Procedural Fluency
3. Strategic Competence
4. Adaptive reasoning
5. Productive Disposition.

We strive to develop pupils' numeracy and mathematical reasoning so that they understand and appreciate the importance of mathematics. We believe that all children should understand, engage with and enjoy mathematics. It is our belief that this will lead to children becoming lifelong lovers and learners of mathematics. We will achieve these aims through a clear and relevant curriculum, high quality teaching and learning, rigorous assessment and strong leadership and management.

### **In line with the National Curriculum (2014), our overall focus is on all pupils being able to:**

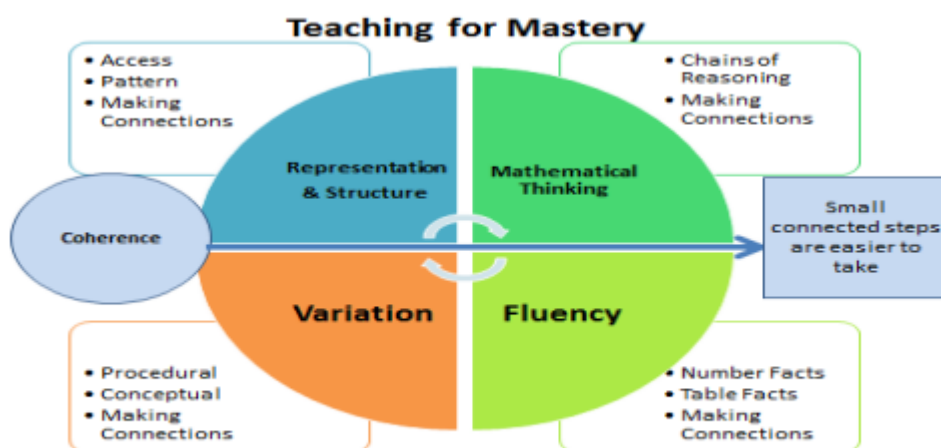
- use and understand a wide range of appropriate mathematical language to discuss, explain and justify their mathematical thinking and reasoning.
- explore and deepen their mathematical understanding through a C-P-A approach, allowing exploration, acquisition of fluency skills and application of skills to a range of problems and lines of enquiry.
- 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.
- move fluently between different representations of mathematical ideas.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.

- 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.
- make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems.
- apply mathematical knowledge across the curriculum, relating mathematical knowledge and skills to real life situations.
- access challenges and problems when they grasp fluency concepts rapidly rather than progressing to new content.
- consolidate learning and concepts through repetition and intervention to acquire sound foundations for fluency of mathematics.

## CURRICULUM

### TEACHING FOR MASTERY

At our school we work with our local Maths Hubs as part of a sustaining mastery work group. We work closely with a mastery lead and other Maths leads across numerous schools to help support and develop Maths provision within school. Our Math's planning is largely based on Schemes of Learning from White Rose Maths and enhanced by a wide range of resources. This ensures a progressive and thorough curriculum in every year group. Teachers know which objectives must be taught and assessed in each year group and can follow progressive small steps to ensure pupils have a comprehensive understanding of mathematics.



## **FLUENCY INVOLVES:**

1. Quick recall of facts and procedures
2. The flexibility and fluidity to move between different contexts and representations of mathematics.
3. The ability to recognise relationships and make connections in mathematics

## **REPRESENTATION & STRUCTURE**

Mathematical structures are the key patterns and generalisations that underpin sets of numbers – they are the laws and relationships that we want children to spot. Using different representations can help children to 'see' these laws and relationships.

## **VARIATION**

Procedural variation – This is a deliberate change in the type of examples used and questions set, to draw attention to certain features.

Conceptual variation – When a concept is presented in different ways, to show what a concept is, in all of its different forms.

## **MATHEMATICAL THINKING INVOLVES:**

- Looking for pattern and relationships
- Logical Reasoning
- Making Connections

## **COHERENCE**

Teachers should develop detailed knowledge of the curriculum in order to break the mathematics down into small steps to develop mastery and address all aspects in a logical progression. This will ensure deep and sustainable learning for all pupils.

1. Our primary focus is to support the children to become fluent in mathematical understanding from the most basic level so that they can build upon their own understanding.
2. We aim to enable our children to develop conceptual understanding, recall of number facts and patterns and apply their knowledge rapidly and accurately.
3. We aim to promote children's ability to reason through opportunities to discuss their thinking and understanding. This emphasis may result in less written work but much deeper understanding.

4. We promote problem solving and solution finding.
5. We aim to support children to make progress at their own pace. Often misconceptions cause greater difficulties at a later stage of learning. We will promote smaller group learning opportunities whenever possible and encourage children to revisit their thinking to ensure they feel secure in their understanding and able to move confidently on to next steps and challenges.

## **TEACHING AND LEARNING**

At Ryhill, we are committed to providing a motivating, challenging and comprehensive curriculum that is accessible to all and links the use of mathematics across a range of subjects, adding meaning to the learning of the subject. Our whole school approach to the teaching and learning of mathematics involves the following;

- Teachers are encouraged to plan in PowerPoint or Notebook software format, creating slides for each 'small step' with teaching points and activities to be completed. This format ensures evaluation of each lesson and subsequent lessons are adapted accordingly.
- WRM (White Rose Maths) promotes kinesthetic learning to ensure children acquire fluency of skills by introducing concepts in a practical/concrete way to progress to pictorial then abstract (C-P-A).
- Teachers deliver one curriculum for all, providing opportunities to stay together and to work through new content as a whole group. Teachers teach the whole class, allow pupils time to practise and bring the class back together to move on. Differentiated learning is provided through a selection of tasks to consolidate fluency, use skills to solve problems or use skills and reasoning skills to solve higher-level challenge problems. Teachers should use their professional judgement to determine the activities, timing and organisation in each lesson in order to suit the teaching objectives and ensure children understand each small step.
- For pupils who may struggle or possibly 'fall behind' with parts of the curriculum, in class support is provided on a daily basis. Additionally, intervention and consolidation are provided in the afternoon or the next morning to ensure they are ready for the next lesson. For SEN pupils (extreme) a separate curriculum may be more appropriate.
- Throughout school pupils have daily mathematics lessons. In Early Years, Year 1 and Year 2 we also have additional mastering number sessions. In KS2 some children may receive mastering number sessions as part of an intervention.
- The teaching of mathematics at Ryhill promotes the use of mathematical vocabulary through encouraging children to explain their thinking, strategies and

mistakes during lessons to embed understanding and to support peer on peer learning as children learn well from peers.

- During lessons, we live mark, this provides children with immediate feedback and time to reflect on their learning. Mistakes are discussed and correction time given as part of a lesson. Children respond well to this and learn well from their mistakes. We see assessment as an integral part of the teaching process and strive to make our assessment purposeful, allowing us to match the correct level of work to the needs of the pupils, therefore benefiting the pupils and ensuring confidence and progress.
- WRM planning is taught in blocks. At the end of the block children complete a post assessment. This is a clear way to measure short-term progress. Objectives for each block are shared and discussed with the children during the block. This ensures children know their learning journey.
- 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. Children need to learn to explain their thinking clearly and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

## **EYFS**

The principle focus of mathematics teaching in the Early Years is to ensure pupils develop their knowledge of numbers, learning to count reliably with numbers from 1 to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing. The EYFS curriculum also develops pupils understanding of shape, space and measures, teaching children to use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.

## **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. At this stage, pupils develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching involves using a range of measures to describe and

compare different quantities such as length, mass, capacity/volume, time and money. Pupils read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

By the end of year 2, we aim for all pupils to 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.

## **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, to 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 will 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. Pupils use measuring instruments with increasing accuracy and make connections between measure and number. Pupils read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

By the end of year 4, we aim for all pupils to have memorised their multiplication tables up to and including the 12-multiplication table and show precision and fluency in their work.

## **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 ensures that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them. Pupils should read, spell and pronounce mathematical vocabulary correctly. By the end of year 6, we aim for all pupils to be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.

## **BREADTH OF STUDY**

Through careful planning and preparation, we aim to ensure that throughout the school the children are given opportunities for:

1. Practical activities and mathematical games.
2. Concrete learning.
3. Pictorial learning.
4. Abstract Learning.
5. Problem solving.
6. Individual, group and whole class discussion activities.
7. Open and closed tasks.
8. A lesson once a week that is devoted to the teaching of mental arithmetic
9. A range of methods of calculating, e.g. mental, pencil and paper and using a calculator.
10. Working with computers as a mathematical tool.
11. Opportunities for deeper thinking.

## **ORGANISATION, PLANNING AND RESOURCES**

All children receive a daily mathematics lesson and mathematical skills run through many other areas of the curriculum.

12. Each lesson focusses on one clear learning objective which all children are expected to master; extension activities enable those children who grasp the objective rapidly to extend their learning by exploring it at greater depth.
13. Each lesson can include elements of: fluency, to practise skills; reasoning, to deepen understanding; and problem solving, to apply skills depending on the objective being taught and the understanding of the children.
14. Teachers use the White Rose Mastery planning and resources to aid mathematics teaching within school. Teachers follow the scheme of work provided by the Maths Hub to ensure full curriculum coverage including fluency, reasoning and problem solving opportunities are addressed within lessons.
15. Each class has a general bank of resources for day-to-day Maths lessons. EYFS classrooms have a wide range of counting equipment for children to explore and use in their learning and play. KS1 classrooms have mathematics resources in provision for children to access during lessons, selecting and choosing resources that will be most helpful to them. Maths



boxes are also available throughout school to support children if, and when, required. Further shared resources are stored in the Maths resource cupboards located in the meeting room. This will be reviewed and added to each year.

16. Each classroom has a Maths 'working wall' showing examples of the unit currently being covered and a permanent display of mathematical symbols, numbers, times tables and vocabulary appropriate to the age range.
17. Each classroom has a TTRS board and access to laptops and iPad to enhance mathematical learning (Timestable Rockstars)
  1. EYFS and KS1 have access to Numbots where they can consolidate their knowledge of number facts and certificates are given out each week to children for the highest scores and most Improved.
  2. In Year 2 and KS2 children have access to TTRS. They can access this at school during morning work and at home. Certificates are given out for the highest scores and most improved and regular competitions in school are held.

### **SPECIAL EDUCATIONAL NEEDS.**

We include all pupils fully in maths activities. We will teach the skills, knowledge and understanding in the mathematics curriculum in ways that are appropriate to the abilities of our children in order to ensure each child reaches his/her full potential. Appropriate key objectives will be incorporated into SM2L plans and special arrangements made through discussions with the teacher, SENCO and outside agencies as necessary. Interventions are set up and decided upon by the class teacher alongside the SENCO and Maths Leader. Interventions will run as necessary in order to allow children to narrow the gap and make good progress. Additional support staff are available in all classes. They work collaboratively with the class teacher and Maths Leader. Support staff teach intervention groups, report back to the class teacher and the results of the children are closely monitored by the Maths Leader. Children with severe SEND will be exposed to the mathematical learning but may need to follow a different curriculum to meet their needs.

### **ASSESSMENT**

Teachers are expected to make regular assessment of each child's progress and to record this on the school data system each half term. Children's scores that they achieve in the test are recorded and the results are analysed by the Maths Leader

Teacher assessment is also used alongside the judgement of the tests. Evidence is drawn from:

1. Pupils Responses in class
2. Children's work

3. Test answers
4. Conversations with children
5. Application across cross curricular links.

Each class completes an end of unit test which is analysed by the teacher for any interventions. At the end of each term each class completes the White Rose end of term assessments and standards are worked out in line with end of KS1 and KS2 statutory assessments. Data is again analysed by the teachers and Subject Leader in order to organise interventions and extra support for any children who may be falling behind. The data analysis will also be used to organise any staff CPD, whole-staff training needs, school development opportunities and future points for the maths action plan.

## **LEADERSHIP AND MANAGEMENT**

### **ROLE OF THE SUBJECT LEADER**

The mathematics Subject Leader, with the support of Senior Leaders and teaching staff, is responsible for ensuring that this policy is implemented consistently and effectively across the school. The mathematics Subject Leader has a responsibility to ensure that all teaching and learning across the school in mathematics is consistently good or better. Where this is not the case, action will be taken to ensure that progress is being made towards this.

The Subject Leader will ensure this through taking part in the whole-school annual monitoring cycle (including lesson observations, coaching, book scrutiny and learning environment walks), as well as being available as a point of contact for any member of staff seeking support with the teaching and learning of mathematics and mastery maths. The Subject Leader will be responsible for giving staff individual and group feedback following monitoring activities and for organising a variety of different CPD opportunities, either internally or externally, as necessary. The Subject Leader will write, amend and implement a rolling maths action plan in order to constantly develop the teaching and learning of mathematics in the school.

### **CPD**

The mathematics Subject Leader will have responsibility for monitoring and supporting the continued professional development of teaching staff within the school, where it relates to the teaching and learning of mathematics.

This will be completed through:

6. Individual written and verbal feedback from monitoring activities
7. Use of a coaching system.
8. Opportunities for peer observations
9. Input for teaching staff within the school's INSET programme
10. Use of Local Authority and external CPD providers
11. Informal support as requested

## **PARENTAL INVOLVEMENT**

At Ryhill we encourage parents to be involved by:

12. Inviting them into school to participate in half termly 'book look' mornings. To look through the children's work, to be informed about the up to date objectives, methods and strategies we use in class.
13. MTC meetings to inform parents of the test and how they can support their child at home.
14. SATs meetings
15. Inviting them to parents' evening each term to discuss the progress of their child.
16. Providing homework to consolidate classroom learning.
1. Providing help sheets for Key Instant Recall Facts that the children are focusing on each term.