

Mathematics Policy



Our Curriculum at Finchale

At Finchale Primary School we are proud of our curriculum and the range of experiences we provide for our children. Our curriculum is accessible to all children, irrespective of their ethnic background, gender, disability, religious or linguistic background. We strive to meet the needs of those pupils with additional needs, including special educational needs, those with disabilities, those who are more able, those with gifts or talents and the children who are learning English as an additional language. We provide a rich and challenging curriculum which aims to stretch our children. Staff monitor our children to ensure that they are supported in their learning, whatever their ability.

Statement of Intent for Mathematics

At Finchale Primary School, we are committed to providing a high quality mathematics education which excites and engages all pupils. This is supported by different activities including our 'Finchale Maths Day' and participating in the Primary Mathematics Challenge. Our carefully planned curriculum allows our pupils to become fluent in the fundamentals of mathematics. This enables them to explain and reason mathematically by using and applying their mathematical understanding, whilst building upon previously learned skills to help them on their journey to master mathematics. We want them to become independent problem solvers who show competence in solving sophisticated problems. Our pupils should take risks in their learning and challenge themselves. We strive to develop their ability to make rich connections within the mathematics programme of study, the whole school curriculum and the wider world. We aim to provide opportunities for our more able mathematicians to be stretched appropriately. We endeavour to develop an enthusiastic, creative and resilient attitude towards mathematics that will stay with them throughout their lives.

Chair of Governors: Mrs. Gayle Foster

Date: 24. 01 24

Head Teacher: Dr. Sandra Whitton

Date: 24.01.24

Mathematics Policy

The Importance of Mathematics

The National Curriculum (DfE, 2014) states that 'Mathematics is a creative and highly interconnected 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 mathematical education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the power and beauty of mathematics, and a sense of enjoyment and curiosity about the subject.'

"Mathematics is a more powerful instrument of knowledge than any other that has been bequeathed to us by human agency."

René Descartes

Aims

At Finchale our core curriculum covers those elements set out in the EYFS statutory framework, as well as the programmes of study for both Key Stage 1 and Key Stage 2 within the National Curriculum for England. In addition, our teaching goes beyond this to include a range of areas and activities which we believe equip our pupils not only with the skills and knowledge but also the confidence and resilience to be happy, productive members of our society today.

To ensure a smooth transition between what children learn in the Early Years and Key Stage 1, we have carefully structured our planning to ensure there are strong and purposeful links between what children learn and experience in Reception and what they go on to learn and experience in Year 1. This helps to build confidence, maximizes opportunities for learning and demonstrates how our staff have a good understanding of how children progress and develop within each subject.

Our starting point for teaching mathematics at Finchale is within EYFS. Here, a key component comes within the specific area, Mathematics. Within this, pupils:

ELG: Number

- ★ Children at the expected level of development will:
- ★ Have a deep understanding of number to 10, including the composition of each number;
- ★ Subitise (recognise quantities without counting) up to 5;
- ★ Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

ELG: Numerical Patterns

- ★ Children at the expected level of development will:
- ★ Verbally count beyond 20, recognising the pattern of the counting system;
- ★ Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;
- ★ Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

Our pupils then move on to develop their mathematical knowledge and understanding as they study the attainment targets and programmes of study for mathematics as set out in the National Curriculum. This 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.

What this means at Finchale Primary

We believe it is important that our children have a firm understanding of the mathematics behind what they are learning and that they can reason, explain and solve problems showing a deeper understanding of different mathematics concepts. We want our pupils to be able to make links to previous learning and to apply what they have learned to a range of mathematical thinking questions that are varied. It is important that our pupils see where their mathematics can be linked to real life scenarios.

EYFS

We believe that the Early Years Foundation Stage is crucial in securing solid foundations that children are going to continue to build upon. We believe that all children deserve to be valued as individuals and we are passionate in encouraging all children to achieve their full, unique potential. With this in mind, we begin each year by looking at the individual needs and interests of our children, taking into account their different starting points. We then work together to develop and carry out our flexible EYFS Curriculum, taking account of the Prime and Specific Areas of Learning. This enables children to follow their learning journey from a point that is suitable to their unique needs and stage of development, supporting them to develop into independent learners with a thirst for knowledge and a desire to learn.

Throughout all of these areas of learning are the Characteristics of Effective Learning. We strive to develop these key characteristics of “Playing and Learning”, “Active Learning” and “Thinking Critically” in order to give the children the skills that they will continue to draw upon throughout their development. The curriculum within our Reception class is shaped by the interests of the children and is very current. Therefore, content will vary from year to year. However, the skills, attitudes and learning opportunities will remain constant as we aim to ensure every child leaving Reception is ready and confident to move onto Year 1.

Mathematics at Key Stage 1

Our aim is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. They should be able to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Pupils should also be able to describe and compare different quantities such as length, mass, volume/capacity, time and money.

Mathematics at Years 3 and 4

There is an emphasis on ensuring that our pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. They will develop their ability to solve accurately a range of problems, including with simple fractions and decimal place value. By the end of Lower Key Stage 2, our pupils should be secure in their recall of their multiplication tables up to and including the 12 times table.

Pupils will develop their ability to draw shapes with increasing accuracy and use mathematical reasoning to enable them to analyse shapes and their properties whilst confidently describing the relationships between them. They should be using measuring instruments with accuracy, making connections between measure and number.

Mathematics at Years 5 and 6

A key focus for pupils in Years 5 and 6 is extending their understanding of the number system and place value to include larger integers, developing their ability to make connections between multiplication and division with fractions, decimals, percentages and ratio. 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 are also being developed. With this firm understanding in arithmetic, our pupils are introduced to the language of algebra as a way of solving a variety of problems.

Further developing their skills, our pupils should consolidate and extend knowledge developed in number during their work on geometry and measures. Pupils should be able to classify shapes with increasingly complex geometric properties and have a secure knowledge of the vocabulary they need to describe them. By the end of year 6, pupils ought to be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Alongside the above objectives runs a desire to implement key reasoning and problem solving skills within lessons and also throughout the wider life of school. In school, we aim to develop children's resilience, focus and problem skills by providing them with relevant challenge via various mathematical representations including open ended problems and real word application.

To support this, our children will use a range of resources and approaches in their mathematics lessons. One way to support children's learning is through the use of **concrete** resources, this includes counters, place value counters, base ten, objects etc. Concrete is the 'doing' stage, using concrete objects to model problems. This helps children to see and understand the mathematical concept by allowing them to experience and handle physical objects themselves. It promotes a deeper understanding of what they are doing.

The **pictorial** stage is the 'seeing' stage, using visual representations of the objects used during the concrete stage to model problems. Children can make a mental connection between the physical object and abstract levels of understanding by drawing or looking at the pictures, circles, diagrams or models which represent the objects in the problem. Some pupils may be confident to start with the pictorial representation but they will always have the option of using concrete resources as and when needed.

The **abstract** stage is the symbolic stage where children use abstract symbols. Once children have demonstrated that they have a solid understanding of the concrete and pictorial stages, they will be introduced to the abstract concept of mathematics; using mathematical symbols and numbers.

The above stages are used to support children's understanding as they move through the fluency, reasoning and problem solving stages. It is important that our children are able to use concrete or pictorial resources at any time of their mathematics learning.

Children's chances of success are maximised if they develop deep and lasting understanding of mathematical procedures and concepts. In order to assist us to fulfil this, we are following the Mastery approach to mathematics. Our aim is for the majority of our pupils to achieve mastery of the subject. Mastery can be defined as:

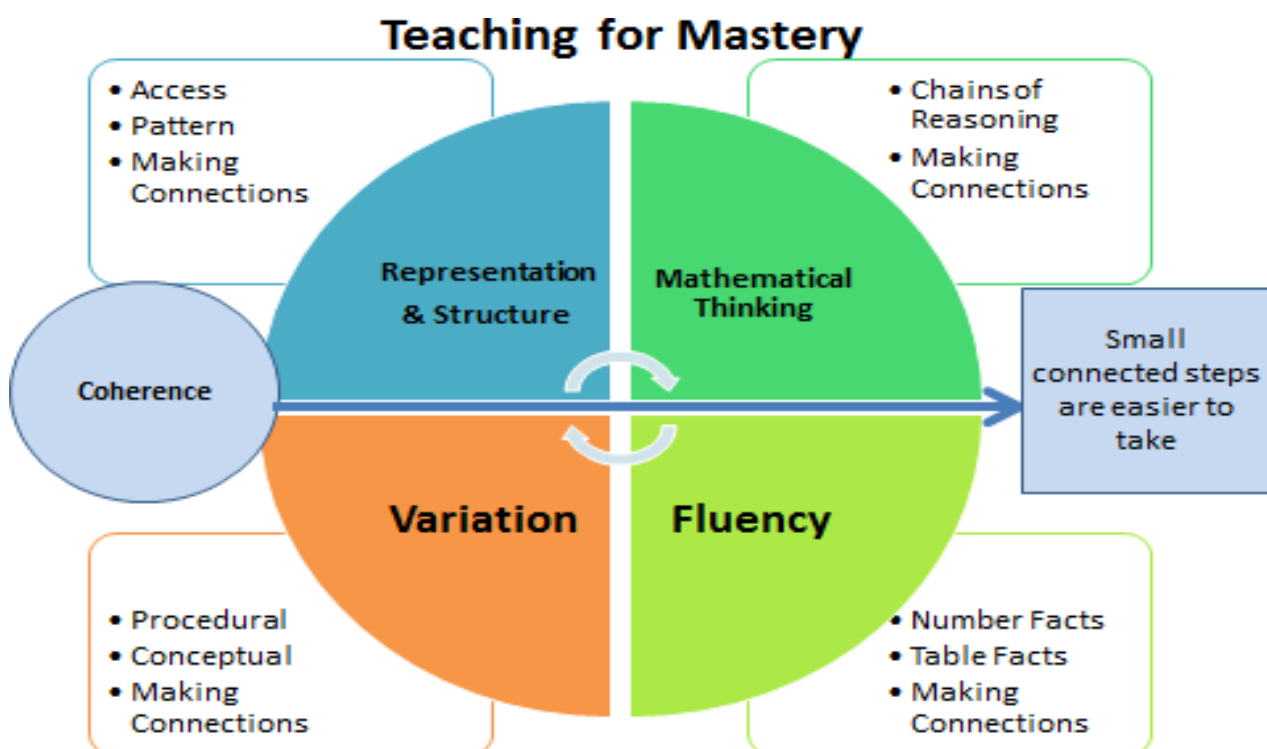
'A mathematical concept or skill has been mastered when a person can represent it in multiple ways, has the mathematical language to communicate related ideas, and can independently apply the concept to new problems in unfamiliar situations.'

Our pupils will follow a carefully planned curriculum and lesson design with the aim of providing a detailed, structured curriculum which ensures continuity and the opportunity to make connections to, and build on, prior learning whilst making future connections when they master new concepts: knowing more and remembering more.

We believe that our children should be able to master mathematics. This means that they are able to learn and use mathematics concepts in various ways, applying prior learning to new learning. They are then able to make conscious links to this prior learning.

We want to develop our learners' mental mathematics skills, their understanding of key concepts and their reasoning and problem skills to equip them for their next steps. This is to ensure that they are ready for the next stage: whether that be moving on to the next year group, or to ensure that they are secondary ready.

What is teaching for mastery?



We endeavor to give our pupils the necessary skills so that they have a mastery understanding in mathematics. In school, we use the White Rose Maths scheme as our primary resource. Staff follow the suggested small steps of learning, adapting these to the needs of the pupils in their class. This is further supplemented by additional mathematical thinking questions for all of our pupils when they have a firm grasp of the fluency of the small step they are currently working on. These small steps build on prior learning and pupils are aware of how to use this prior knowledge to enhance their understanding.

Fluency

For children to have fluency in mathematics, they are ready to recall and apply mathematical knowledge both rapidly and accurately. Fluency allows children the opportunity to move confidently between contexts and representations, recognise relationships and make connections. This skill is taught to ensure pupils are confident with the fluency of a mathematical concept. Once this is evident, they are able to move on to applying these skills to reasoning and problem solving.

Fluency involves:

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

Representation and 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.

For more information on the different representations we use in school, please see our Marvellous Maths page on our school website:

<https://www.finchale.durham.sch.uk/marvellous-maths/>

On here, the PowerPoint from the parent meeting where some of these representations and structures are explained is available to view.

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

Our children will be taught how to apply their fluency skills into reasoning about different mathematical concepts. A key part of this is using the correct mathematical language to support their explanations. Our aim is to provide our children with the skills and ability to use their reasoning skills and mathematical vocabulary so that rather than saying what the answer is, they can fully explain how they know it is the correct or incorrect answer. We want our children to be able to explain in full sentences using appropriate and correct mathematical vocabulary. We will question our pupils by asking: Prove . . . Convince me . . . Explain . . .

Our children will then move on to problem solving, where they will be encouraged to use all of the skills they have acquired on their mathematics journey. They will identify, understand and apply these skills to problem solving, correctly identifying a way to solve the problem that is presented to them by applying and making links to their prior learning and making future connections.

This can be done through:

- ★ Looking for pattern and relationships
- ★ Logical Reasoning
- ★ Making Connections
- ★ Giving clear explanations using the correct mathematical language

Coherence

Teachers should develop detailed knowledge of the curriculum in order to break the teaching of 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.

Through the implementation of our curriculum, we are aiming for our pupils to become assured, happy and resilient mathematicians who relish the challenge of mathematics. They become independent, reflective thinkers, whose skills not only liberate them in mathematics but also support them across the curriculum.

Teaching Mathematics Should Equip Children To:

- ★ Make links to prior learning
- ★ Apply their learning to a variation of contexts
- ★ Develop logical and methodical thinking,
- ★ Reason and explain their answers using mathematical language
- ★ Apply their skills to real life situations
- ★ Ask critical questions
- ★ Identify similarities and differences

Threads of Learning

We have identified a set of key mathematical aspects or 'threads', that children will repeatedly revisit throughout their time at Finchale. For mathematics, they focus on the continuous learning journey: retrieval of known facts, making links to prior learning and applying what they have learned to a wide variation of mathematical scenarios. Each unit will not include every 'thread' but, over the course of their learning journey through school, children will visit each thread more than once. As children progress through school, they will begin to make links and connections between these threads to support them in gaining a wider understanding of how history has moulded modern society.

Making Learning Memorable

At Finchale, we aim to make learning memorable through the careful planning and delivery of enriching activities. We have Finchale Maths Day and partake in NSPCC Number Day whilst also having our own TTRockstars/NumBots Day alongside this. We also hold weekly TTRockstars competitions across Key Stage 2, where the winning class keep the KS2 Maths Award for that week.

Organisation

Our mathematics curriculum is drawn from a range of resources. We do use the White Rose Maths scheme as our main mathematics resource for the sequence of teaching. This will be further enhanced by reasoning and solving problems (mathematical thinking) from other resources including, but not restricted to, NRich, Grammarsaurus, Testbase, TTRockstars and Planpanion.

'White Rose Maths aims to shape happy, confident and resilient learners who discover that mathematics brings an exciting journey of discovery, understanding – and a lifetime of opportunities'.

Long term plans and the Progression of Skills, detail the units taught and the sequence of learning through school. Teachers identify their content from these and provide knowledge organisers for each unit of work. The knowledge organisers have a clear knowledge and skill development focus and place importance and priority on developing a child's vocabulary understanding and use. These are shared with pupils and placed on class pages so parents can share in their child's mathematical journey.

Parental Involvement

We encourage parents to be involved by:

- Having a 'Meet the Teacher' event during the first week of the academic year. During this, the class teacher shares the curriculum plan (as well as other important messages) for the year.
- Communicating with parents during our Parents' Evenings in the Autumn and Spring Terms to share progress and achievements in mathematics.
- Producing an end of year report which details achievements and targets in mathematics. Those pupils who have attended intervention sessions across the year also receive an additional report.
- Providing parents with knowledge organisers at the beginning of a new mathematics unit. The first one is given to parents and they are then placed on the class page on the school website after this.
- Holding workshops for parents on how we teach mathematics in school and the representatives we use.
- Sending homework activities weekly to be completed by or with their child. The knowledge organisers are also helpful with homework.

Inclusion

Teaching maths for mastery offers all pupils access to the full mathematics curriculum. This inclusive approach, and its emphasis on promoting multiple methods of solving a problem, builds self-confidence and resilience in pupils. Though the whole class goes through the same content at the same pace, there is still plenty of opportunity for differentiation. Taking a mastery approach, differentiation occurs in the support and intervention provided to different pupils, not in the topics taught, particularly at earlier stages. There is no differentiation in content taught, but the questioning and scaffolding individual pupils receive in class as they work through problems will differ, with higher attaining children, or those pupils who grasp concepts quickly, challenged through more demanding problems which deepen their knowledge of the same content. Those children who are not sufficiently fluent are provided additional support to consolidate their understanding before moving on. Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with intervention – commonly through individual or small group support.

At Finchale we believe that all children have the right to learn and to participate in our curriculum. On occasions, it may be appropriate to make adaptations to our curriculum in order to ensure all SEND pupils can be fully included in each lesson. We follow the advice of other professionals and agencies who provide support for SEND pupils (e.g. Speech and Language Therapist, Educational Psychologist, Occupational Therapist etc.) and ensure their recommendations are included in both their Education Support Plans and in day-to-day class teaching. Adaptations can be provided in a number of ways including the use of modified or additional resources and support from a peer or an adult. A fuller list of such adjustments and advice can be found in our SEND Policy which is located on our school website www.finchale.durham.sch.uk

Where children make less than expected progress efforts are made to ensure relevant support is put in place to help support the child. No child will be denied a full curriculum and concepts will be revisited throughout the year during challenge times or intervention times to help with long term understanding.

Resources

Each class has a range of concrete resources and additional ones can be found in the mathematics area in the staffroom

Websites:

- ★ <https://whiterosemaths.com/resources/>
- ★ <https://classroomsecrets.co.uk/>
- ★ <https://ttrockstars.com/>
- ★ <https://www.goodstuffprimaryresources.com/free-goodstuff.html>
- ★ <https://www.ncetm.org.uk/>
- ★ <https://nrich.maths.org/>
- ★ <https://www.bbc.co.uk/cbeebies/shows/numberblocks>
- ★ <https://nrich.maths.org/>

Assessment

Our subject leader for mathematics oversees the planning and monitoring of pupils' work. At the end of a White Rose Maths unit, all pupils should complete the WRM end of unit assessment task. The information gained from this will be used to inform staff of any booster sessions that may need to take place to address any misconceptions.

Years 1, 3, 4 and 5 will continue to use the NTS assessments (on a termly basis) and Years 2 and 6 will use previous SATs papers (on a termly basis) for their summative assessments.

Updated: November 2023

Due for review: November 2025