'Believe. Achieve. Be Proud.'

Maths Policy

Lyngford Park Primary School & Nursery

Annually reviewed by Maths Lead.

Signature *N. Arnold* *Headteacher* *Date March 2025*

Signature *F Forsyth* *Chair of Governors* *Date March 2025*

Introduction:

This policy promotes the basic and wider understanding of mathematics and hopes to instil an enjoyment in the subject by supporting children to engage with it and build upon their own understanding and promote further learning.

Learning skills are an important aspect of mathematics but such skills are only a means to an end, and should be taught and learned in a context that provides purpose and meaning. This policy should be read in conjunction with the following school policies:

- Fluency Policy (appended to this document)
- Effective Feedback Policy
- SEND Policy
- Equality Policy

NC Links

The programmes of study for mathematics are set out year-by-year for key stages 1 and 2. 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. 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 be based on the security of the pupils' understanding. Lyngford Park follows the National Curriculum with the teaching of mathematics and ensures all of the above takes place.

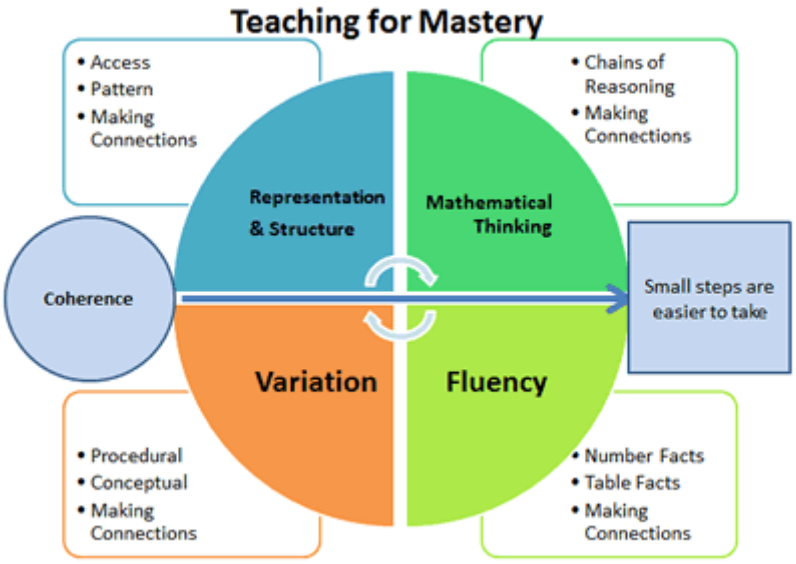
Our Vision:

At Lyngford Park we work in partnership with the Boolean Math's Hub to develop and promote a mastery approach to mathematics within our school. We believe mathematics is essential to everyday life. Children need to have the ability and confidence to be able to do maths at the required level to help them succeed and reach their full potential. We aim to provide a high-quality mathematics education with a mastery approach so all children can:

- become **fluent** in the fundamentals of mathematics.
- **reason mathematically;**
- **solve problems** by applying their mathematics.
- **achieve the required outcomes** to set them up for the future.
- have the confidence and **enjoyment of mathematics**.

The intention of teaching for mastery is to give **all** pupils (including those with SEND) access to **equitable** classrooms; classrooms where pupils can all participate and be influential, and classrooms where pupils are encouraged and supported to develop a deep connected and sustained understanding of the mathematics being explored. (MathsHubs)

What is teaching for mastery?



Coherence

Lessons are broken down into small, connected steps that gradually unfold the concept, providing access for all children and leading to a generalisation of the concept and the ability to apply the concept to a range of contexts.

Representation and Structure

Representations used in lessons expose the mathematical structure being taught, the aim being students can do the maths without recourse to the representation.

Mathematical Thinking

If taught ideas are to be understood deeply, they must not merely be passively received but must be worked on by the student thought about reasoned with and discussed with others.

Fluency

Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics.

Variation

Variation is twofold. It is firstly about how the teacher represents the concept being taught, often in more than one way, to draw attention to critical aspects, and to develop deep and holistic understanding. It is also about the sequencing of the episodes, activities and exercises used within a lesson and follow up practice, paying attention to what is kept the same and what changes, to connect the mathematics and draw attention to mathematical relationships and structure.

The Five Big Ideas- NCETM in 2017.

As a result of teaching and learning in mathematics, our aim is that pupils will be able to meet the key aims of the National Curriculum for maths.

EYFS

In Reception, mathematics is taught 4 times a week following the mastering number programme produced by the NCTEM. Lessons embed children's number sense and encourage partner participation and talk within lessons. We aim to support the children with their early understanding of number and give them many different representations of the maths that they are learning. Problem solving and reasoning is weaved throughout the curriculum and many opportunities arise throughout the day for this to happen. Once a week an exploratory and investigation maths session happens. This will give them the opportunity to explore the maths in different ways and to show their mathematical thinking. All areas of the maths curriculum are covered throughout the year which are stated in Development Matters and the Statutory Framework. There are also many opportunities for purposeful, play based experiences and will be represented throughout the indoor and outdoor provision. Mathematical understanding can be developed through stories, songs, games, imaginative play, child-initiated learning and structured teaching. As pupils progress, they will be encouraged to record their mathematical thinking in a more formal way.

Key Stage 1 Maths:

The principal focus of mathematics teaching in key stage 1 is to ensure pupils develop confidence and mental fluency. The essential idea behind the mastery approach is that all children have a **deep understanding** so that future learning continues to build on solid foundations. If the subject is represented using **concrete materials, pictorial representations and abstract symbols**, it will allow children to visualise maths in varied ways, see connections and to independently explore and investigate a topic. **Practical activities and resources** offer the children a deeper mathematical understanding of more complex concepts. Providing children with **visual representations** also offers a scaffold when developing a more robust understanding of maths. Throughout Key Stage 1, it is important children gain a **secure knowledge of number and place value** and become confident when using the four operations in both formal methods as well as **problem solving** where often the approach is not immediately evident.

Within Key Stage 1 children will not only have their daily maths lessons but also have 15 minutes a day following the NCTEM programme of mastering number. Here, the objective is to continue to embed number sense for the children so that they can have **mental fluency of number facts** when they progress into key stage 2.

Key Stage 2 maths

Lower Key Stage 2 – Years 3-4.

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 pupils start 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 should also ensure 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 they can use measuring instruments with accuracy and make connections between measure and number.

When children start year 3 the NCTEM mastering number will also be used to support children in any gaps that they have with their number fluency and fact understanding. This will then move onto developing and mastering their multiplication fact knowledge.

By the end of Year 4, pupils should have memorised their **multiplication tables** up to and including the 12 times table and show precision and fluency in their work.

Upper Key Stage 2 – Years 5-6.

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.

Parental Involvement:

We encourage parents to support their children in maths by:

- Inviting parents to evenings either face to face or online twice a year.
- Supporting their child with knowing and understanding their number facts / times tables (these will be given to you by the class teacher).
- Maths homework - they will support and check they are accessing this
- When maths sessions are run by the school they will attend to understand how the school teaches maths so they can best support their child.

Inclusion

Teaching maths for mastery is different because it offers all pupils access to the full maths curriculum. This inclusive approach, and its emphasis on promoting multiple methods of solving a problem, builds self-confidence and resilience in pupils.

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, however, and concepts will be revisited throughout the year during challenge times or intervention times to help with long term understanding.

Organisation

All children receive a daily maths lesson that focusses on one clear learning objective which all children are expected to master. Lessons in years 1 - 6 follow a broadly similar structure:

- Mental oral starter.
- Consolidation of previously taught content.
- Pre-requisites needed to access the lesson.
- New learning is introduced practically, visually and with lots of active learning.
- Children apply new knowledge to independent learning.

Each lesson can include elements of fluency, to practise or consolidate skills; reasoning, to deepen understanding; and problem solving, to apply skills depending on the objective being taught and the understanding of the children.

Lessons are planned using the NCETM Curriculum Prioritisation and Professional Development materials.

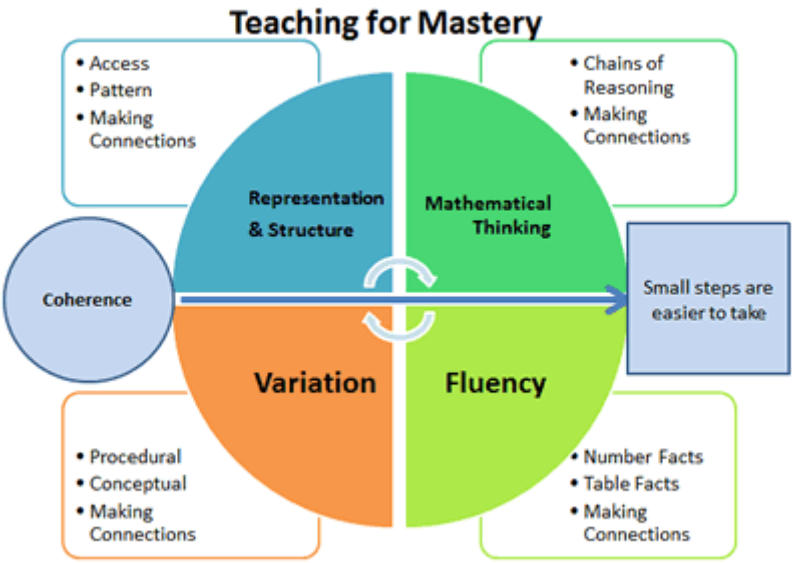
Assessment:

At the end of each term, children will complete an arithmetic paper and a problem-solving and reasoning paper from Curriculum Maestro. This will be used to establish the amount of progress made by pupils over the course of each term. A full suite of analysis tools are also available to support teachers to assess areas of the maths curriculum that need further teaching or consolidation.

Appendix A

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



Fluency is one of the 'Five Big Ideas'. These are principles drawn from research evidence that underpin a 'Teaching for Mastery' approach. Fluency goes hand-in hand with the other ideas that lie at the heart of maths mastery pedagogy.

A child who is fluent in key maths facts has the ability to quickly and efficiently recall facts and procedures and has the flexibility to move between different contexts and representations of mathematics.

At Lyngford Park Primary School, there is an emphasis on the importance of developing fluency with mathematical facts. Mathematics lessons begin with a fluency activity. Children are also given regular opportunities within and outside of maths lessons to practise basic facts and develop flexibility with these facts.

Concrete resources and visual representations are used to support children's understanding and development of key concepts and to enable them to become fluent in basic maths facts. Resources and representations will include stem sentences, Numicon, tens frames, rekenreks, bar-models, part-part-whole models, place value counters and Dienes apparatus amongst others. As fluency with facts and concepts develops, children will become less reliant on physical resources and representations and will be able to automatically recall the number facts they have been focussing on.

Children in Reception and KS1 have daily lessons to develop their factual fluency from the NCETM Mastering Number Programme which is also used as an intervention with children throughout KS2.

Developing fluency in addition and subtraction facts

Why do we need to focus on fluency in addition and subtraction facts?

A defined set of addition and subtraction facts builds the basis of all additive calculation.

If children are not fluent in these facts, when they are solving more complex problems which rely on their knowledge of additive relationships, their working memory will be taken up with calculating the basic facts and they will have less working memory to focus on solving the problem. Fluency of basic facts enables children to solve complex maths more effectively and efficiently.

Fluency is one of the three aims of the national curriculum

Children need to be taught strategies to solve these facts. If they are not explicitly taught strategies, i.e. to solve 5 + 6 by thinking of double five plus one more, they are more likely to rely on inefficient counting-based approaches.

What facts do children need to be fluent in?

Children need to be fluent in the following addition facts:

+	0	1	2	3	4	5	6	7	8	9	10
0	0 + 0	0 + 1	0 + 2	0 + 3	0 + 4	0 + 5	0 + 6	0 + 7	0 + 8	0 + 9	0 + 10
1	1 + 0	1 + 1	1 + 2	1 + 3	1 + 4	1 + 5	1 + 6	1 + 7	1 + 8	1 + 9	1 + 10
2	2 + 0	2 + 1	2 + 2	2 + 3	2 + 4	2 + 5	2 + 6	2 + 7	2 + 8	2 + 9	2 + 10
3	3 + 0	3 + 1	3 + 2	3 + 3	3 + 4	3 + 5	3 + 6	3 + 7	3 + 8	3 + 9	3 + 10
4	4 + 0	4 + 1	4 + 2	4 + 3	4 + 4	4 + 5	4 + 6	4 + 7	4 + 8	4 + 9	4 + 10
5	5 + 0	5 + 1	5 + 2	5 + 3	5 + 4	5 + 5	5 + 6	5 + 7	5 + 8	5 + 9	5 + 10
6	6 + 0	6 + 1	6 + 2	6 + 3	6 + 4	6 + 5	6 + 6	6 + 7	6 + 8	6 + 9	6 + 10
7	7 + 0	7 + 1	7 + 2	7 + 3	7 + 4	7 + 5	7 + 6	7 + 7	7 + 8	7 + 9	7 + 10
8	8 + 0	8 + 1	8 + 2	8 + 3	8 + 4	8 + 5	8 + 6	8 + 7	8 + 8	8 + 9	8 + 10
9	9 + 0	9 + 1	9 + 2	9 + 3	9 + 4	9 + 5	9 + 6	9 + 7	9 + 8	9 + 9	9 + 10
10	10 + 0	10 + 1	10 + 2	10 + 3	10 + 4	10 + 5	10 + 6	10 + 7	10 + 8	10 + 9	10 + 10

these are the corresponding subtraction facts:

-	0	1	2	3	4	5	6	7	8	9	10
1	1 – 0	1 – 1									
2	2 – 0	2 - 1	2 – 2								
3	3 – 0	3 - 1	3 - 2	3 – 3							
4	4 – 0	4 – 1	4 – 2	4 – 3	4 – 4						
5	5 – 0	5 - 1	5 – 2	5- 3	5 – 4	5 – 5					
6	6 – 0	6 – 1	6 – 2	6 - 3	6 – 4	6 – 5	6 – 6				
7	7 – 0	7 - 1	7 – 2	7 - 3	7 – 4	7- 5	7 – 6	7 – 7			
8	8 – 0	8 - 1	8 – 2	8 - 3	8 – 4	8 -5	8 - 6	8 - 7	8 - 8		
9	9 – 0	9 - 1	9 – 2	9 - 3	9 – 4	9 - 5	9 - 6	9 - 7	9 - 8	9 – 9	
10	10 – 0	10 - 1	10 - 2	10 - 3	10 - 4	10 - 5	10 - 6	10 - 7	10 - 8	10 - 9	10 – 10
11		11 - 1	11 - 2	11 - 3	11- 4	11 - 5	11 - 6	11 - 7	11 - 8	11 - 9	11 – 10
12			12 – 2	12 - 3	12 - 4	12 - 5	12 - 6	12 - 7	12 - 8	12 - 9	12 – 10
13				13 – 3	13 - 4	13 - 5	13 - 6	13 - 7	13 - 8	13 - 9	13 – 10
14					14 - 4	14 - 5	14 - 6	14 - 7	14 - 8	14 - 9	14 – 10
15						15 – 5	15 - 6	15 - 7	15 - 8	15 - 9	15 – 10
16							16 – 6	16 - 7	16 - 8	16 - 9	16 – 10
17								17 - 7	17 - 8	17 - 9	17 – 10
18									18 - 8	18 – 9	18 – 10
19										19 – 9	19 – 10
20											20 - 10

Note that not all subtractions within 20 are root facts, e.g. 17-5 is not considered a root fact (7-5 is the root fact for this).

The majority of these facts will be learnt in Year 1 and Year 2. In Reception, children become fluent in working with totals to 5 (though not recording as equations), e.g. “Show me 5 on your hands. Now show me 5 in a different way.” Year 3 will need to focus on securing fluency in subtraction facts which bridge 10. Although this is a Year 2 objective, aiming for real fluency in subtraction facts such as 14 – 9 and 13 – 5 (where fluency is an answer in 3 seconds) requires securing in Year 3.

Does fluency just mean memorisation?

Not necessarily – most rely on very quick use of strategies to solve some of them. Fluency can mean getting an answer quickly and with limited demands on working memory.

Most facts which don't bridge 10 are memorised, 4 + 5 = 9 or 2 + 6 = 8 for example.

For facts which bridge 10, the picture is more complex and many of the facts which bridge 10 are quickly derived using strategies (but still in less than 3 seconds).

- Double 6, 7 8 and 9 can be memorised in fluent children.
- Many fluent children may 'just know' that 9 + 3 = 12 and 8 + 4 = 12 and relate this to their times table/skip counting knowledge.
- Fluent children use strategies for many of the other facts. E.g. 9 + 8 –with fluency this can be solved through very quickly applying a strategy: bridging, near doubles or compensating.

How do children become fluent?

Children need to be **taught** strategies to derive the facts. Teaching strategies are more effective in securing fluency in addition and subtraction facts than taking a rote memorisation approach. Children are taught to truly understand the relationship between numbers so that they can verbalise their mathematical thinking and explain why, for example, 5 + 8 = 13. Concepts are planned and taught in a structured way to ensure that children have the pre-requisite knowledge required to access learning in their daily maths lessons. Progression of fluency in number facts is taught as follows:

Year 1 – Develop fluency in addition and subtraction facts within 10.

Children are taught to:

1. Add 1 (e.g. 7 + 1 and 1 + 7)
2. Doubles of numbers to double 5 (e.g. 4 + 4)
3. Adding 2 (e.g. 4 + 2 and 2 + 4)
4. Number bonds to 10 (e.g. 8 + 2 and 2 + 8)
5. Adding ten to a number (e.g. 5 + 10 and 10 + 5)
6. Adding 0 to a number (e.g. 3 + 0 and 0 + 3)
7. The ones without a family! 5 + 3, 3 + 5, 6 + 3, 3 + 6

Knowing these facts by the end of year 1 will mean that children already know 87 of the 121 addition facts in the grid.

Year 2 – Secure fluency in addition and subtraction facts within 10 through continued practice.

Children have 34 addition facts left to learn – they are the ones that bridge 10. Our aim is for children to use known facts or derived fact strategies to quickly recall or derive each fact. We need to ensure that all children move beyond counting based strategies. This requires careful teaching of the strategies combined with plenty of opportunities to practise them.

1. Doubles of numbers to 10 (e.g. 7 + 7)
2. Near doubles (e.g. 5 + 6 and 6 + 5 can be derived from knowing that double 5 is 10)

3. Bridging ten (e.g. 8 + 4 and 4 + 8 can be derived from adding 2 to 8 first to make 10 then adding another 2 to reach 12)
4. **Compensating (e.g.8 + 9 = 8 + 10 – 1)**

These strategies can be used interchangeably. Before children are ready to learn bridging as a strategy, they need to be able to partition all single digit numbers, therefore the following facts need to be taught alongside the above facts:

- Partitioning 2, 3, 4, 5, 6 and 10
- Partitioning 7, 8 and 9
- Partitioning 11 – 20 into single-digit addends

Year 3 – Secure fluency in addition and subtraction facts that bridge 10, through continued practice including addition of any two, single-digit addends.

Children will continue to practise the strategies they have been taught in years 1 and 2 to develop and retain their recall of the number facts required.

Once children have been taught the strategies, they need to move on to **PRACTISE** of the facts. The aim is for an average of 3 seconds or less per fact.

Generally, for practise

- We focus on practising the set of facts being learnt (or just learnt) in isolation
- We focus on mixing these up with all previously learnt facts

Developing fluency in multiplication and division facts

Fluency in the recall of times tables facts and related division facts is essential to ensure that children can access more complex maths in Upper Key Stage 2. Children at Lyngford Park Primary School are provided with regular opportunities, both in class and through homework activities, to develop times tables knowledge. This ensures rapid recall of multiplication and division facts.

By the end of Year 4, children are expected to be fluent with their times tables and related division facts up to 12 x 12. This is broken down and taught as follows:

Year 2: 2, 5 & 10 times tables

Year 3: 3, 4 & 8 times tables

Year 4: 6, 7, & 9 times tables

Because the children learn the facts up to 12 times the focus tables, they will automatically have learnt the 11 and 12 times tables with the exception of 11 x 11, 12 x 11 and 12 x 12.

In Years 5 & 6, children continue to practise their times table recall using the whole-school approach.

How we teach times tables

We use a whole-school approach to the teaching of times tables and the related division facts which starts in the spring term of year 2. Children have a daily times table lesson of 10 – 15 minutes where they learn the facts using visual representations to support their understanding. This is followed by a times table quiz of 40 questions which the children

have three minutes to answer. Teachers use the quizzes to understand which facts still need to be learnt to automaticity and ensure that these are the focus of future sessions.

Further relationships and connections in times table facts are taught through our maths curriculum where the use of the NCETM Curriculum Prioritisation materials supports children to make connections and notice patterns therefore deepening their understanding of multiplicative relationships.

Fluency in times tables at Lyngford Park Primary School is reinforced through use of the Times Tables Rock Stars programme. Children have the opportunity to use this at school and are encouraged to use it at home as daily times tables practice. The programme is used in classes in a competitive way and the children find the programme fun, engaging and motivating to use.

All these aspects are aligned across the other Richard Huish Trust Primary Schools.