



Lyon Park Primary School

Learning and Growing Together



Mathematics POLICY FEBRUARY 2020

INTRODUCTION

Purpose

The purpose of this policy is to describe our practice in Mathematics and the principles upon which this is based.

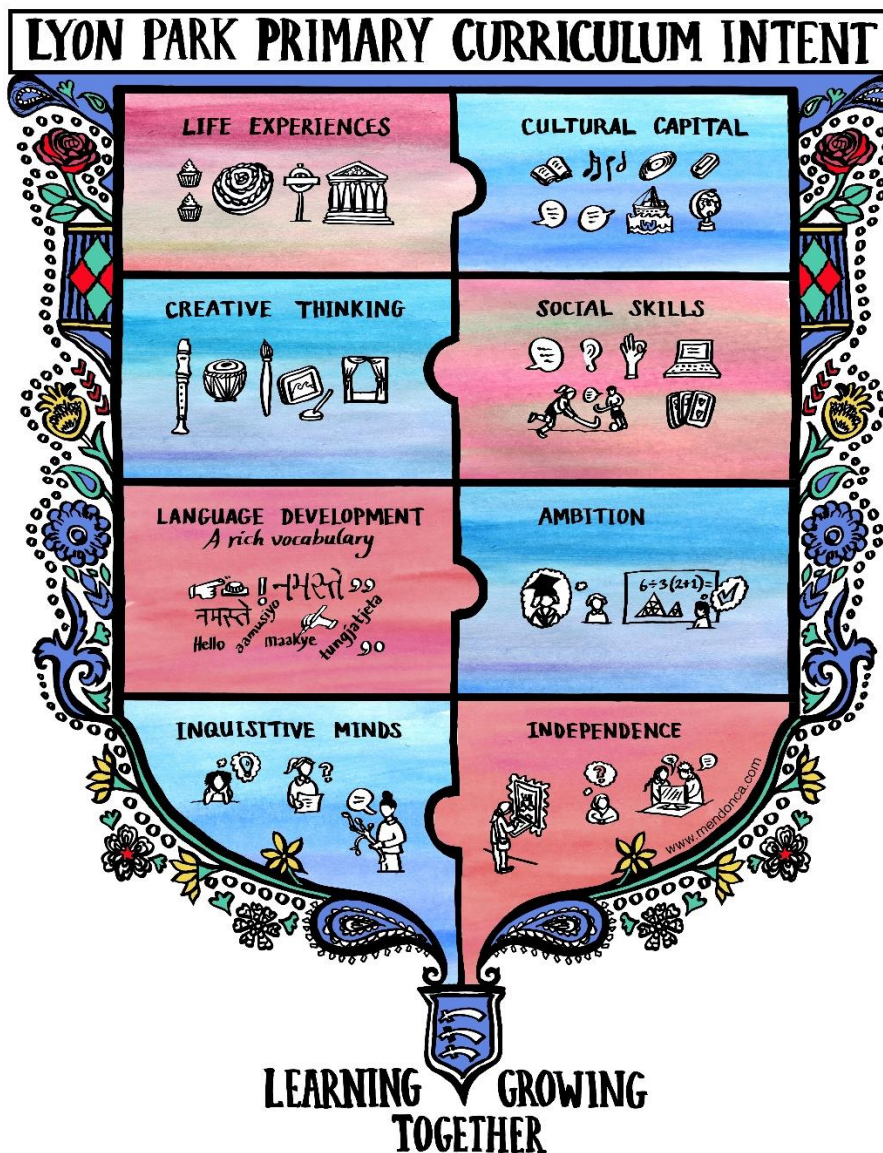
Aims

Our work in Mathematics enables our pupils to become numerate, creative, independent, inquisitive, enquiring and confident. We also aim to provide stimulating learning environments and resources so that pupils can develop their mathematical skills to the full.

At Lyon Park Primary School we have adopted the Maths Mastery concept and use White Rose planning to teach Maths. Maths Mastery allows our children to acquire a deep, long-term and secure understanding of the subject. This scheme meets the requirements of the National Curriculum (2014). The 5 Big Ideas in Teaching for Mastery include: Coherence, Representation and Structure, Mathematical Thinking, Fluency and Variation. We believe all children can succeed and make good progress in Maths regardless to their starting points and needs.

Our pupils should:

- have a well-developed sense of the size of a number and where it fits into the number system
- demonstrate fluency with number facts such as number bonds, multiplication tables, doubles and halves
- calculate accurately and efficiently, both mentally and in writing and paper,
- draw on a range of calculation strategies
- make sense of number problems, including non-routine/'real' problems and identify the operations needed to solve them
- explain their methods and reasoning, using correct mathematical vocabulary
- Use a range of different representations to demonstrate and support their understanding
- judge whether their answers are reasonable and have strategies for checking them where necessary
- suggest suitable units for measuring and make sensible estimates of measurements
- explain and make predictions from the numbers in graphs, diagrams, charts and tables
- develop spatial awareness and an understanding of the properties of 2d and 3d shapes
- children acquiring a deep, long-term, secure and adaptable understanding of the subject



The intention of the maths curriculum at Lyon Park Primary School is that children are taught to become competent and independent mathematicians. We follow the Maths Mastery Approach as the small steps in the teaching methodology help pupils build a deep conceptual understanding which will enable them to apply their Maths learning in different situations. We also encourage mathematical talk among children to develop the ability to articulate, discuss, and explain their thinking. This teaching approach is inclusive to learners of all kinds. All children should have access to the same curriculum content. There will be some children who are using practical equipment for longer to support learning. ‘Rapid graspers’ will deepen their conceptual understanding by reasoning and problem-solving. Our aim is that the gap between mathematical attainments in our classes is closed, with a particular focus on accelerating the progress of pupils to enable them to meet their personalised attainment targets. The following table shows our school’s Maths intent for children.

<p>Life Experiences</p> <ul style="list-style-type: none"> • Managing finances • Being a numerate citizen • Understanding of money to work out change and budget 	<p>Cultural Capital</p> <ul style="list-style-type: none"> • Encourage people from different careers to visit to explain why maths is important to them • See how mathematics is utilized in the ‘real world’
<p>Creative Thinking</p> <ul style="list-style-type: none"> • Knowing when to apply different strategies to solve a range of problems • Developing systematic thinking • Problem solving • Knowing there is more than one way to solve a problem 	<p>Social Skills</p> <ul style="list-style-type: none"> • Develop the role of maths buddies across the school • Understanding how money works: change; interest etc. • Developing cooperative and collaborative skills

<p>Language Development; a rich vocabulary</p> <ul style="list-style-type: none"> • Understanding and being able to securely apply the language of mathematics in different contexts 	<p>Ambition</p> <ul style="list-style-type: none"> • Understanding how maths is important for career choices • Have regular maths competitions
<p>Inquisitive Minds</p> <ul style="list-style-type: none"> • To enjoy mathematical problems/investigations and a willingness to explore them 	<p>Independence</p> <ul style="list-style-type: none"> • Being able to tell the time • Use money responsibly • Application of maths in a variety of life skills including: reading time tables, cooking, DIY etc. • To apply knowledge acquired to move on to advanced Maths

IMPLEMENTATION

Roles and responsibilities

Governors:

- review the policy
- understand the rationale for adopting the Maths mastery approach
- understand the teaching and learning sequence of the school and the expectations for implementation
- monitor the intent, implementation and impact of the school program
- the school's governing body receive regular updates to inform them of the vision for continually driving forward teaching for mastery

Senior Leadership Team:

The AHT with responsibility for maths shall:

- discuss regularly with the Headteacher and the mathematics governor the progress of implementing National Curriculum for Mathematics in school
- deploy support staff to address mathematics related needs within the school's phases
- have strategic overview of Maths teaching across the school
- to work with the Maths Leads to monitor and evaluate the teaching of Maths provision across the school
- to analyse Maths data and report to SLT

Subject Leaders:

- ensure teachers understand the requirements of the National Curriculum and help them to plan lessons
- to ensure teachers are covering the Maths concepts as detailed in the National Curriculum
- lead by example by setting high standards in their own teaching
- prepare, organise and lead CPD and joint professional development
- work with the SENDCO to meet the needs of children on the SEND register
- observe colleagues periodically with a view to identifying the support they need
- keep parents informed about Mathematics issues
- monitor and evaluate mathematics provision in the school by conducting regular work scrutiny, learning walks and assessment data analysis
- update the AHT for Maths with regular updates on Maths provision in their phase
- to team teach and model lessons for teachers when required

Teachers:

- each class teacher is responsible for the mathematics in their class in consultation with and with guidance from their phase's Maths Leader
- to ensure coverage of the Maths curriculum as detailed in the National Curriculum
- to adapt lessons regularly to meet the needs of children they teach to ensure all children make progress
- to deploy support staff, when available, to address mathematics related needs within the class
- ensure that they are up to date with school policy and curriculum requirements regarding PSHE
- attend and engage in professional development training around Maths provision, including individual and whole staff training/inset, where appropriate
- attend staff meetings to be introduced to any new areas of work and review the effectiveness of the approaches used
- report back to the Maths Lead on any areas that they feel they need further support on
- tailor their lessons to suit all pupils in their class, across the whole range of abilities, faiths, beliefs and cultures, including those pupils with special educational needs

- ask for support in this from the school SEND coordinator or the Maths Lead, should they need it
- to ensure individual children's needs are being met

Support Staff:

- under the direction of the Teacher, cover teachers and support staff will deliver the Maths scheme and fulfil the roles and responsibilities as mentioned above

Pupils:

Pupils are provided with a variety of opportunities to develop and extend their Mathematical skills, including:

- group work
- paired work
- whole class teaching

Pupils engage in:

- the development of mental strategies
- written methods
- practical work
- investigational work
- problem solving
- mathematical discussion
- consolidation of basic skills and number facts

Parents/Carers:

At Lyon Park, we encourage parents/carers to be involved by:

- inviting them into school twice/three times yearly to discuss the progress of their child
- providing parents/carers with current targets and a yearly report outlining their child's achievements
- holding workshops for parents/carers to share the maths scheme in particular the Calculation policy
- sending homework activities weekly to be completed by or with their child
- encouraging parents/ carers to support children at home using the methods used at school
- providing support and encourage parents/carers to seek additional support from school where they feel it is needed

Aspects

Equal opportunities:

Positive attitudes towards mathematics are encouraged, so that all children, regardless of race, gender, ability or special needs, including those for whom English is a second language, develop an enjoyment and confidence with mathematics.

The aim is to ensure that everyone makes progress and gains positively from lessons and to plan inclusive lessons. Lessons involving lots of visual, aural and kinaesthetic elements will benefit all children including those for whom English is an additional language (EAL).

Differentiated questions are used in lessons to help children and planned support from Teaching Assistants and other adults.

Inclusion

At Lyon Park Primary we believe that all learners are of equal value and that all pupils have the potential to achieve highly and learn effectively irrespective of ethnicity, gender, disadvantage, religion and belief, race or disability. This confidence in the learning capacity of all our pupils is reflected in curriculum design and delivery.

Pupils with Special Educational Needs & Disability (SEND)

Pupils with Special Educational Needs and Disabilities (SEND) will have access to a broad and balanced curriculum through quality first teaching. Teachers will differentiate learning according to the children's needs to ensure access to the curriculum. Children identified as having SEND may in addition have additional provisions such as personalised learning, 1:1 support and a variety of resources to meet their needs. This policy should also be read in line with the school's SEND policy and School information report.

EAL learners

Pupils identified as new to the English language will be given every opportunity to acquire English so that they can access learning fully. Pupils' home languages will be used to aid learning where possible and relevant alongside appropriate resources selected by staff to enable pupils to engage in a rich curriculum.

Health and safety:

The children will be taught and expected to use all equipment safely during all sessions.

Safeguarding:

If a matter of safeguarding arises, it will be dealt with according to the safeguarding procedures of the school. Please see the Safeguarding Policy.

Planning:

Our school scheme of work is a working document and as such is composed of:

- long Term Maps, following the White Rose Mathematics Curriculum Maps, exemplifying the breadth of coverage across each year group
- medium term plans, following the White Rose Blocks. These plans progressively cover the PoS as set out in the maths Curriculum 2014 for each year group
- ongoing plans produced on a week by week basis and reviewed daily as necessary. These are developed from the Medium Term plans, taking into consideration the needs of our children
- teachers in Foundation Stage base their teaching and learning on objectives within the Framework for Foundation Stage; this ensures that they are working towards the 'Early Learning Goals for Mathematical Development'

Teachers will need to consider the needs of their pupils when planning. Should pupils require access to curriculum content outside of the year level they are in, teachers must adapt their planning accordingly. This will require teachers to find a relevant objective or set of objectives from earlier or later year level curriculum content and design a sequence of lessons pitched at the appropriate level for all children to access the learning.

Although the school is using White Rose as a long term plan and the Maths Mastery pedagogy and to guide medium term planning, teachers must use their professional judgement when selecting lesson content, resources and assessment. They should consider the needs of their pupils and the overall teaching and learning of Mathematics at Lyon Park Primary school. This includes providing regular opportunities for children to demonstrate fluency, problem solving and reasoning. The planning should also follow the school framework, based upon the White Rose elements of varied fluency, problem solving, reasoning, representation and variation.

Teaching:

All children receive a daily maths lesson, although mathematical skills run through many other areas of the curriculum.

- 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
- incorporates Maths Mastery which allows our children to acquire a deep, long-term and secure understanding of the subject
- lesson sequence includes elements of: **fluency**, to practise skills; **reasoning**, to deepen understanding; and **problem solving**, to apply skills
- teachers use the White Rose Mastery planning and other resources to draw up medium term plans for each term, and a daily lesson plan is produced to incorporate the above elements
- whole class teaching is adopted and children work in mixed ability groups OR children are placed into ability sets within their year groups. All classrooms have maths displays with key vocabulary clearly displayed
- see teaching Sequence (see Appendix)

Organisation:

- every classroom has a range of practical apparatus to support children's learning, with additional resources stored centrally
- each class has a required Maths Working Wall (see display and working wall policies)

Homework / Wider learning: See homework policy

Resources: See Appendices

EYFS

There are two aspects of the mathematics curriculum, Number and Shape, Spaces and Measure. Maths should be made meaningful for young children. Where possible, concepts should be taught in the context of real life and play. Practical and concrete resources are used to model concepts. Resources are accessible for pupils to use as and when they need them. It is important that children have hands on experiences of solving problems. Worksheets and unnecessary recording are not appropriate.

Maths is taught through carpet sessions, adult-led activities and activities within the indoor and outdoor provision. The environment must include aids to develop mathematical understanding e.g. numbers, number lines, vocabulary and shapes. Working walls and maths areas must reflect current teaching.

Practitioners must make links to everyday maths where opportunities arise. This can include; posing questions, solving problems and modelling mathematical language during interactions.

IMPACT

Assessment:

Daily Assessment

Assessment is an integral part of teaching and learning and is a continuous process. Teachers make assessments of children daily through;

- regular marking of work
- analysing errors and picking up on misconceptions
- making observations

These ongoing assessments inform future planning and teaching. Lessons are adapted readily and short term planning evaluated in light of these assessments.

Summative assessment

Teachers are expected to complete target tracker for each child, termly. Their judgements will be informed by classwork and end of term tests.

At the end of Key Stage 1 and Key Stage 2 children will undertake written assessments each half term.

Monitoring and evaluation:

The monitoring of maths teaching and pupil progress is the shared responsibility of teachers, subject leader and the senior leadership team. The work of the subject leader includes:

- supporting colleagues in the teaching of maths
- keeping up to date with current developments as well as providing a strategic lead and direction for the subject
- regular book looks and planning checks to ensure a consistent approach towards the teaching of maths across the school is being observed and children are making the expected progress

3 beads and 2 beads is 5 beads altogether
 $3 + 2 = 5$

Additional text: "Addition and subtraction are inverse operations..."

Children must be able to recall and apply multiplication facts up to 12×12 .

Counting and halving
 Counting amounts of money using partitioning.
 Use doubling and halving as a strategy in multiplying by 2, 5, 10 and 20.
 Written methods: 15×75 , 62×14 , 63×46

Using number facts
 Use three square facts up to 12×12 to multiply multiples of 10/100 of the multiplier.
 e.g. $4 \times 5 = 20$ so $40 \times 5 = 200$ and $400 \times 5 = 2000$
 Use knowledge of factors and multiples in multiplication.
 e.g. 45×8 is double 40×8
 e.g. 28×30 is half of 28×60 (2800×100)
 Three square numbers and cube numbers.

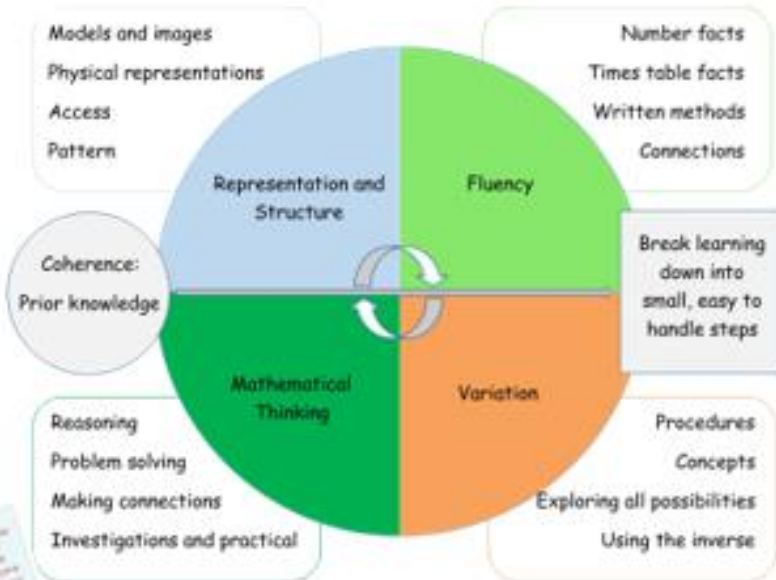
Multiply up to 4 digits by 1 or 2 digit

Step 1 - short multiplication for multiplying by 1 digit

Step 2 - long multiplication for multiplying by 2 digits

Step 3 - moving towards more complex numbers

Resources to help build concepts



- Hundreds
- Represent numbers to 1000
- 100s, 10s and 1s (1)
- 100s, 10s and 1s (2)
- Number line to 1000
- Find 1, 10, 100 more or less than a given number
- Compare objects to 1000
- Compare numbers to 1000
- Order numbers
- Count in 50s

Varied Fluency

What is the value of the number represented in the place value chart?

Hundreds	Tens	Ones
2	3	5

Write your answer in numerals and in words.

Complete the place value chart so that it shows the number 354

Hundreds	Tens	Ones
3		4

Represent the number using a part-whole model.

How many different ways can you make the number 652?
 Can you write each way in expanded form? (e.g. $400 + 50 + 2$)

Compare your answer with a partner.

True or False?

100 is 10 times as many as 10.
 1000 is 10 times as many as 100.
 1000 is 100 times as many as 10.
 1000 is 1000 times as many as 1.

100 is 10 times as many as 10.
 1000 is 10 times as many as 100.
 1000 is 100 times as many as 10.
 1000 is 1000 times as many as 1.

100 is 10 times as many as 10.
 1000 is 10 times as many as 100.
 1000 is 100 times as many as 10.
 1000 is 1000 times as many as 1.

100 is 10 times as many as 10.
 1000 is 10 times as many as 100.
 1000 is 100 times as many as 10.
 1000 is 1000 times as many as 1.

Mathematical Talk

- What is the value of the number shown on the place value chart?
- Why is it important to put the values into the correct column on the place value chart?
- How many more are needed to complete the place value chart?
- Can you make your own numbers using Base 10? Ask a friend to tell you what number you have made.

Children should understand that a 3-digit number is made up of 100s, 10s and 1s.

They read numbers shown in different representations on a place value grid, and write them in numerals.

They should be able to represent different 3-digit numbers in various ways such as Base 10 or numerals.

