



# Maths

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<b>Governor Role</b>	

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## Introduction

Mathematics is a creative and highly inter-connected 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 mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. (*National Curriculum 2014*)

### **The aims of the National Curriculum are to ensure that our 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.

The National Curriculum sets out year-by-year programmes of study for key stages 1 and 2. This ensures continuity and progression in the teaching of mathematics.

The EYFS Statutory Framework sets standards for the learning, development and care of children from birth to five years old and supports an integrated approach to early learning. This is supported by the 'Development matters' non statutory guidance.

### The EYFS Framework in relation to mathematics aims for our pupils to:

- develop and improve their skills in counting
- understand and use numbers
- calculate simple addition and subtraction problems
- describe shapes, spaces, and measures

## Aims

At Loxdale Primary School, we aim to offer pupils a rich and enjoyable experience in mathematics by providing the knowledge, skills, concepts and processes that are appropriate to each individual and that relate to the world around them. This provision should enable them to:

- develop a positive and confident attitude towards mathematics and to achieve their full mathematical potential;
- develop logical thinking, enquiring minds and an ability to record in a systematic way;
- use maths to interpret, predict, explain and solve problems involving as much practical experience as possible;
- develop the correct mathematical vocabulary and other skills necessary to express their thinking and strategies in an appropriate manner;



- develop their ability to work independently and collaboratively, as appropriate;
- use technology within mathematics lessons and in the development of their mathematical concepts;
- use and apply their mathematical knowledge by making appropriate choices in real-life situations.

## Role of the Subject Leader

- Ensure teachers are familiar with outstanding teaching methods to promote achievement in maths and help them to plan lessons;
- Provide strategic leadership, including with maths mastery;
- Lead by example in the way they teach in their own classroom;
- Prepare, organise and lead CPD, with the support of the Senior Leadership Team;
- Work with the SENDCo and Teaching Assistants in delivering interventions;
- Observe colleagues with a view to identifying the support they need;
- Attend CPD and network meetings;
- Inform parents of any updates;
- Discuss regularly with the Headteacher new innovations to be introduced;
- Deploy support staff to address needs within the school;
- Monitor and evaluate mathematics provision in the school;
- Work with external agencies to support the delivery of maths;
- Regular feedback provided to governors of updates and new initiatives.

## General Teaching Aims

To ensure that there is continuity and progression in maths throughout the school in line with the guidance from National Curriculum.

To recognise that mathematics is a body of knowledge and children should be encouraged to remember vocabulary, notations, conventions and results, leading to them developing the skill of rapid recall.

To develop skills in the correct use of equipment such as rulers, compasses, protractors etc. and to recognise when the use of such equipment is appropriate and encourage the children to use the correct equipment.

To make explicit links between real-life problems, as this will develop an understanding of mathematical concepts.

To recognise that mathematics is a life skill and to ensure that real life contexts are used as frequently as possible.

To develop strategies and skills e.g. decision making, estimating, approximating, linking to previous work, simplifying tasks, reasoning, testing hypotheses and good working habits.

To develop the use of technology, especially the interactive whiteboard and increasing use of apps: this offers a powerful tool in the modelling of mathematical concepts and is used wherever it is felt to be appropriate.

To develop cross-curricular links, by using pupils' mathematical understanding, skills and strategies in other subject areas whenever this is appropriate. Look for opportunities to implement maths throughout the CoJo curriculum and science.



To support children in achieving mastery of the subject at the level at which they are working, providing opportunities to apply their learning and challenge in their thinking.

## Curriculum

In EYFS, developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

In Years 1-6, there are 5 dedicated numeracy sessions per week, in which teachers will follow the agreed long term and medium term plan, from the White Rose curriculum. Within these lessons, there will be an element of mental maths and additional topics being re-visited.

In Key Stages 1 and 2 there will be an additional one half hour arithmetic session per week. In this session, at least six questions will be set (three based on the prior week's learning and three covering skills taught that year, or from previous years). The intention of this time is to ensure the consolidation of maths skills - this will, in turn, enable the teacher to be aware of children's ongoing understanding.

In Key Stage 2, there will also be an additional one half hour session per week dedicated to times tables, including a test and reciting, or learning the times tables appropriate to the year group. It is down to individual teachers' discretion as to when this half hour lesson will be.

## Planning

### Long term planning

We follow the White Rose planning for all pupils.

### Medium term planning

The White Rose Maths Hub provide schemes of learning as their medium term planning documents. These schemes provide teachers with exemplification for maths objectives and are broken down into fluency, reasoning and problem solving, key aims of the National Curriculum. They support a mastery approach to teaching and learning and have number at their heart.

*All of this planning is to be used in conjunction with the school's concrete, pictorial, abstract calculation policy approach.*



## Teaching and Learning

- Some pupils who require additional input eg pre-teaching, with mathematical needs are identified as part of a 'Same Day Intervention' group. This group will change daily, as it is based on specific issues with that days learning.
- Marking reflects a 'live'/ 'here and now' element, so that feedback can be given instantaneously and can be improved/corrected quickly. Following this, the subsequent lesson begins with 'CAT' - Challenge, Application or Teach (extra input).
- The school has developed its own **calculation policy**, which should be followed in order to provide a scaffold that moves from concrete apparatus, to a visual representation and finally, working in the abstract for any particular concept.
- The use of manipulatives is strongly encouraged in lessons.
- A variety of teaching strategies are used within each year group, which support the children's learning.
- Direct teaching to the whole class using interactive techniques is a common approach employed by teachers.
- Direct teaching is also used in guided group situations, where there is a teacher and child led discussion how questions are solved, as well as the opportunity to identify and address any misconceptions.
- Individual work, to encourage the application and practise of new skills and methods, is a regular feature. There is also the opportunity to build up confidence, as set out in the school's Mission Statement.
- Where available, Teaching Assistants support individuals, pairs or groups of children in various aspects of the lesson.
- Discussions and explanations also feature in many lessons, as children will be encouraged to explore their own and others' ideas, as an essential part of the learning process.
- Opportunities for discussion through activities that apply learned maths are provided in each Core lesson and it expected that this is planned in to promote the discussion and reasoning of children, using a variety of resources e.g. 'Application ' cards, 'Challenge Cards', 'Comprehension and discussion cards' etc (see also Mastery in Mathematics Document).
- Interactive Whiteboards are used to enhance children's understanding of a wide variety of mathematical concepts, whenever possible. Examples include Smart Notebooks and apps if appropriate.

## Marking

In Maths books, teachers will use 'CATS' marking: Challenge, Application, Teach.

At the start of a lesson, children will complete a question, or series of questions independently, according to **previous marking**. The 'Challenge' and 'Application' questions in particular ensure that children are regularly being presented with opportunities to reason and problem solve. The children will be given a few minutes to complete these questions at the start of a lesson and then the teacher will work with the children to model either the 'Challenge' or 'App', applying different techniques to develop the children's reasoning and problem solving skills.

The NCETM, in conjunction with MathsHub, produced guidance for Years 1-6 - 'Teaching for Mastery'; each of these provided exemplifications for questions that allowed children to have a 'mastery' of a given concept, and further to have mastery 'at a greater depth'. These are used as a guideline for teachers when setting their 'CATS' questions, as follows:



- **Challenge** green comments can use either the 'mastery at greater depth' questions from NCETM, or a question of a similar 'difficulty', that encourages children to apply a learned concept in order to reason, or solve problems. These will therefore usually be indicative of a child who may be working at greater depth in their year group targets.
- **Application** green comments can use either the 'mastery' questions from NCETM, or a question of a similar 'difficulty', that encourages children to apply their learning, often to a new representation, or context. These may support children's 'fluency' in maths, allowing them to see how they can use one fact in many different ways.
- **Teach** green comments will be used when children have not fully understood a day's new learning and need intervention. The teacher or TA will work with these children, providing them with a model and revision of the prior day's learning.

Teachers must ensure the children complete these CAT tasks and model appropriate techniques.

## Working Walls and resources

Staff will ensure each working wall feature relevant vocabulary, worked examples, errors as a model of the teaching point.

All classes will display a place value chart, appropriate to their year group, as well as times tables appropriate to their year group. In Key Stage 1, staff will also ensure a number square is on display for children's reference.

## Differentiation

It is expected that children are not moved on to the next year groups' targets, but if able, are allowed to 'deepen' their understanding.

Differentiation can be by task set, the resources available for a task, the level of support given or, in the case of open-ended investigations, by outcome. Within a lesson, independent work will be set at three 'levels': Hot, Spicy and Super-spicy work, with 'Hot' being the least challenging and 'Super-spicy' providing the greatest challenge. Children are able to access their learning as they feel appropriate on any given day, though the teacher will guide the children in their choice where necessary.

Teachers should, where possible, identify an overarching target taken from the National Curriculum, and set differentiated activities accordingly.

Individuals may receive specific targets as part of an IEP at which point, it is at the teachers' discretion how provision will support the child in achieving this.

In order to promote 'mastery', children who have completed their given tasks will be given the opportunity to 'Hook a DUC'; these are a series of open ended activities that can be applied to nearly all learning concepts. These require children to apply their learning in different ways, in order to promote a deeper understanding of their learning.



## Special Needs (including Gifted and Talented)

- Children with learning difficulties and those who are mathematically able are supported through a differentiated curriculum and are given opportunities to develop skills at an appropriate rate.
  - On-going informal assessment, in the form of targeted questioning, and daily marking directly informs the learning objectives set for each individual. As a result, appropriate challenges and opportunities are planned for and delivered - Same Day Intervention will support in doing this.
  - Children with specific mathematical learning needs will have provision made through the targets set from the Birmingham Toolkit, or, if Disadvantaged, other support e.g. through targeted questioning.
  - Teaching Assistants and other adults in school are used to support individual children. ( a range of manipulatives can be explored to support these pupils.)
  - The SEND policy gives details of the arrangements for specific support.
- Children that are operating above the national expectation may have access to separate interventions to challenge them, as well as differentiated and challenging work within class.

## Non-Negotiables

- CAT marking (see Marking above).
- Following White Rose Maths scheme
- Use of a range of manipulatives/ resources to encourage varied fluency.
- Use of school Calculation Policy when choosing methods by which to work using concrete apparatus, pictorial and abstract methods for recording.
- Daily counting
- Direction to TTRS - including for homework setting too

## Assessment and Recording

Formative assessment, carried out by the class teacher, is an integral part of their role and is used on a daily basis to inform future planning. It involves identifying children's progress against the learning challenges set for the lesson through planning. Assessments are made through questioning, live marking, observation, discussion and note-taking and termly testing. These assessments are used to determine what a child has already achieved and to identify their next steps in learning.

Staff meet in phases to discuss and moderate children's work in year groups. SLT and subject leader monitoring help to support teachers in their delivery of maths.

Summative assessment occurs at the end of each term; in Years 1-6, years 2 and 6 may use past SATs papers to assess and support children's learning in conjunction with these.

Application/Challenge questions will be used to support formative assessment, as informed by the NCETM documents and taken also from White Rose scheme, Testbase, or developed by teachers.

## Homework and Parental Engagement

Weekly homework is set and is designed to encourage parental involvement and understanding of their children's learning, much of the homework is set on-line. Children without access to a computer are given the opportunity to complete this in school.



## Monitoring

The monitoring of Maths occurs at least half-termly to fit in with the School Development Plan, through the collection of assessment data, learning walks, book and planning scrutiny, pupil interviews and observations. Next steps are then identified and support put in place to meet these next steps. This means then that monitoring can always be focused on the areas, as identified by the SDP, or ongoing needs of staff and pupils.

## Staff Development

Continuing Professional Development needs are identified by individual members of staff and by the Senior Leadership Team. Staff are encouraged to continue to update and extend their personal knowledge and understanding of mathematics on a regular basis. These are addressed in termly Staff Meetings, school-based INSET, courses run by White Rose Maths, Numeracy Training Courses and individual work with the maths lead.

## Use of Technology

The use of technology is referred to throughout this policy, but further to this, Times Tables Rockstars will be used to support the children in learning their multiplication facts. Teachers will encourage their children to use this regularly and, along with the subject leader, will check on children's usage, celebrating their achievements with this.

Other Apps and software can be used to support the teaching of maths, such as the interactive lessons and resources developed by White Rose Maths. Education City will be used in the setting of homework too.

## Equality and SMSC

Loxdale ensures that we eliminate all discrimination, on the grounds of race, gender, gender reassignment, disability, sexuality (including sexual orientation), age, religion and belief. We believe that all pupils, employees and other service users should be treated with dignity and respect at all times and we will not tolerate bullying, harassment or victimisation of any groups or individuals.

We will ensure that in planning, delivering and monitoring our strategies and policies, equality and diversity issues are considered at the outset of that work and that we will consult with pupils, parents, staff, partners where appropriate and the wider community.

Collaborative activities in maths will support the children's *Social* development.

## Links with Parents

- Parents are given opportunities to meet with the teacher and discuss their child's progress and a detailed written report is provided towards the end the academic year, which includes information about children's progress and next steps in their mathematical learning.
- Class teachers and the maths lead are always available to discuss maths strategies with parents.

