

LEYS FARM JUNIOR SCHOOL

MATHEMATICS POLICY 2021

Purpose

The National Curriculum states 'Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas.' Therefore, the intention for mathematics is to ensure that all pupils become fluent, reason mathematically and solve problems. 'Pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems.'

At Leys Farm Junior School (LFJS), we teach our children how to make sense of the world around them by developing their ability to calculate, reason and solve problems. We want our children to recognise and understand relationships and patterns in numbers in the world around them. We expect Mathematics to be utilised as a tool beyond the daily mathematics lessons and beyond the classroom.

The Aims of the Policy

At LFJS, we aim for children to:

- develop a positive attitude to maths and know how it can be enjoyed;
- become fluent with the fundamentals of mathematics and be able to use rapid recall competently;
are confident with conceptual understanding in the subject through frequent and varied practice;
- experiment with number; adopting flexible, open-ended approaches to real life applications and solving problems;
- think clearly and logically for themselves;
- transfer skills to use in other areas of the curriculum;
- reason and conjecture in maths;
- work both independently and through participation and collaboration with others;
- gain confidence with their ability to use maths in a growing range of contexts;
- apply knowledge to new and known concepts in order to calculate more efficiently;
- solve an increasing range of mathematical problems by applying their knowledge to both routine and non-routine problems by working systematically and with increasing accuracy.

Intent

At LFJS, we believe that children should be encouraged to develop a positive learning attitude giving them the confidence to enable them to reach their full potential. Through the KS2 Mathematics National Curriculum, every child is given the opportunity to combine the abstract maths concepts alongside real life applications. Together with these life skills, children are given the opportunity to develop a range of tools to help them shape the future in the form of reasoning, problem solving activities and mathematical thinking.

Provision at LFJS allows our children to become both fluent in the fundamentals of mathematics and to enable them to develop a solid conceptual understanding. Building on KS1 skills, they consolidate number skills, improve rapid recall to enable them to apply their knowledge accurately. Allowing children opportunities to develop and use these skills across a range of other subjects ensures that children become competent mathematicians ready for today's challenging world.

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 always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered

rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

Implementation

Maths planning at LFJS is carried out in three phases across all year groups – long-term, medium-term and short-term planning. The maths content follows the NC objectives and Programmes of Study to ensure appropriate pace, progression and coverage of the subject. Coverage is continually reviewed by class teachers and adapted as necessary to ensure coverage of maths objectives. Reasoning and problem-solving activities are included to ensure children who have understood a particular concept, can progress to deepen their understanding and become fluent problem solvers.

Lessons are planned and sequenced so that new knowledge and skills build on previous knowledge and understanding. Teachers follow the White Rose Maths Hub materials as their starting point, following the LTP and Termly objectives. Teachers include a variety of practical maths and try to link to topic if possible.

A Times Tables focus is planned to give children the opportunity to practise and improve their rapid recall skills with facts 12x12. Children enjoy the challenge and strive to improve their time and score each week. All children have access to their own personal account of 'Times Tables Rockstar' where they can compete against other pupils and classes in school.

Our pupils are encouraged to physically represent mathematical concepts. Objects and pictures are used to demonstrate and visualise abstract ideas, alongside numbers and symbols. Concrete – children have the opportunity to use concrete objects and manipulatives to help them understand and explain what they are doing. Pictorial – children then build on this concrete approach by using pictorial representations, which can then be used to reason and solve problems. Abstract – with the foundations firmly laid, children can move to an abstract approach using numbers and key concepts with confidence.

Impact

By the time children leave LFJS, they are competent with their ability to use maths independently and are prepared for the next stage in their learning journey. Children know that maths is an essential part of everyday life and are equipped with the skills and knowledge to apply to a range of situations. They can use mathematical language to enable them to think and discuss their understanding in maths. The National Curriculum for mathematics 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 of 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;
- solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication.

Monitoring and Evaluation

The Headteacher, Maths Subject Leader, Maths team and teachers monitor the development of maths throughout the school. When priorities are identified, The SLT and maths leader contribute to an action plan that may form part of the School Development Plan. This forms the basis for monitoring activities and will identify who, when and which

priorities are to be monitored and how this will take place. The Headteacher and Governor for Mathematics plan opportunities to visit and observe maths activities and displays.

The Maths Subject Leader monitors and evaluates the quality and standards of mathematics throughout the school each half term. This is done by pupil interviews and collecting samples of work from children in each class each half term for work scrutiny. Work is routinely moderated within year groups to ensure consistency.

Analysis of test data is carried out to find out areas of strength and areas to develop in mathematics.

Planning

The new National Curriculum 2014 forms the basis of teaching and learning in mathematics and sets out the objectives for each year group. Following the NC ensures continuity and progression is followed throughout the school.

The Programmes of Study are set out year-by-year and the expectation is that the majority of children will move through these at the expected pace. In mixed age classes, children will work on similar objectives in line with age related expectations.

Currently, due to Covid 19, teachers are using the White Rose Maths catch up planning. This is to cover lost learning due to lockdown.

Teachers use the White Rose Maths scheme, which follow the New National Curriculum for Mathematics 2014 as a starting point for creating long term and medium-term plans. Schemes are adapted to follow particular themes or topics to incorporate cross curricular activities and tasks which include consolidation weeks. Lessons follow a mastery approach and make use of the CPA approach to teaching and learning.

Links to NRich activities are included where possible and used to develop children's understanding of rich mathematical concepts. A variety of resources including Abacus, Maths No Problem and Target Your Maths are used to deliver maximum coverage and incorporate real life skills. Deeper learning tasks and activities are sourced from a variety of providers including White Rose Maths Hub, NCETM, Keen Kite and Rising Stars reasoning along with Headstart problem solving materials.

Children are taught a wide range of concepts and skills delivered through daily maths lessons and a variety of cross curricular visits and activities. There is a focus on refining skills in procedural fluency which ensures children make sustained progress. In years 3 and 4 a greater emphasis is placed on developing children's understanding of numbers and the number system, calculation methods and problem solving with geometry, measure and statistics are given appropriate time over each term. These children benefit from the use of the CPA approach. Children are given opportunities to reason mathematically and work on problem solving activities with an increasing degree of accuracy.

The mastery approach enables the majority of children to work through concepts at broadly the same pace and is delivered with support from CPA, practical apparatus and adult support. For those children who grasp concepts rapidly, the curriculum will offer challenge through the provision of deeper reasoning and problem-solving activities. These require the application of a range of mathematical concepts to develop thinking and reasoning skills before any acceleration through to new content.

Using the range of resources, teachers plan and prepare lessons with the aim of giving children opportunities ranging from practical activities and mathematical games; problem solving; individual, group and whole class discussions and activities; open and closed tasks; a range of methods to calculate include pencil and paper and opportunities to use iPads and laptops for a variety of mathematical applications.

Lessons follow a similar format which allow children to rehearse number skills and patterns - Counting, Flashbacks to Prior Learning, Learn-its, where children focus on a set of table facts and Assessment for Learning (AfL), to enable

learners to decide on their task suited to their own level. Children are then able to decide their own learning task and move through this at their pace. They can accelerate through to tasks designed to deepen their understanding and move them on to the next stage of their learning. Problem-solving tasks are available for children to use when they have completed their task. Opportunities for intelligent practice activities are included in lessons where possible.

Impact on Other Areas of the Curriculum

We incorporate maths into a wide range of cross curricular subjects and seek to take advantage of multi-cultural aspects of maths. Where possible, real life experiences gained through visits and practical aspects of maths lead to a richer development of skills required for the deeper understanding of maths concepts.

English language and the range of vocabulary is crucial to teaching maths when using the variety of resources including tests, as language will enable the children to be able to understand the task and enable them to decide the approach to answering the calculation/solving the problem. Rich mathematical language is developed through everyday teaching as children are given the knowledge and understanding of key vocabulary to allow them to calculate efficiently.

Maths is an essential component to many other subjects including PSHE and Citizenship and children are encouraged to make links as often as possible. Statistics and data is useful for not only research and comparing but also to compare meaningful information.

In art and DT, maths is essential to assist with measuring accurately and ensuring design specifications are met. Maths open days are implemented into the curriculum to raise the profile of Maths within our school.

British Values

The maths curriculum promotes the British Values of tolerance and resilience through problem solving and understanding of complex concepts. Children are required to persevere to solve problems. Teamwork is central to maths through peer assessment, mentoring and group work. Mutual respect is developed as children work together and build confidence in one another. Children can feel safe to make mistakes and take risks in problem solving, thus developing self-confidence and esteem. Children are encouraged to become life-long learners alongside developing their mathematical skills across the curriculum through enterprising and problem solving.

Cultural Capital

At LFJS, children are encouraged to develop their understanding of the origin of maths and how it has been taught through the ages. Making strong links with history, children find out about the important mathematicians including Euclid, Archimedes, Pythagoras and Fibonacci and the theories they are famous for. Escher believes that maths and art has strong links and this is conveyed through the maths and art displays around school. Enriching experiences including working on Enigma codes enable children to find out about Alan Turing and his work during WWII.

Opportunities are given for children to acquire an understanding of finance and its application when working on small business ventures. Children refine skills in understanding discounts and concepts including tax and interest. Looking at deforestation allows children to understand key issues on our planet and debates relating to finance and deforestation issues.

Strong links with science will help children to understand about the vastness of the solar system, the speed of light and distances between celestial bodies.

Assessment, Recording and Reporting

Assessment resources and activities to develop deeper understanding are sourced using the White Rose Maths materials, NCETM assessment materials and the NRich website.

Computing technology resources are used within lessons to support and enhance learning opportunities.

Assessments are made in line with school assessment policy. Formative assessment takes place on a daily basis and teachers adjust planning accordingly to meet the needs of their class. Group or individual targets are set accordingly. Marking is in line with the school marking and feedback policy. The teaching of Maths is monitored frequently by leaders through lesson observations, book scrutiny each half term and pupil discussions.

Summative assessment takes place at the end of each term and children's progress and attainment is discussed with senior leaders in pupil progress meetings. End of unit assessments from White Rose Maths are used throughout each term and these can be used to set personal learning targets. NFER testing is used termly to inform teacher assessment alongside teacher judgement and recorded using the assessment tool on ScholarPack.

Children are aware of their targets and are involved with setting their own steps to success. They can review these through self, peer and teacher assessment.

At the end of Year 6, children are tested in line with current legislation.

Equal Opportunities and Inclusion

All children are taught within the daily maths lesson and are encouraged to become more independent learners.

Within the daily maths lesson, teachers not only provide activities to support children who find maths difficult but also activities to provide appropriate challenges for children who are high achievers in maths. Lessons are differentiated for children requiring further support and through the use of adult and apparatus support. In some instances, maths probes are used daily to support children with specific difficulties. Same day interventions are used for children who have not met the learning challenge.

In Years 5 and 6, groups receive additional support through small group intervention sessions as well as to promote reasoning and problem-solving activities. These interventions are delivered through two part time support teachers.

Children with English as an additional language (EAL) as well as a range of identified needs are included in the daily maths lessons with appropriate support following the CPA approach and with differentiated activities.

Pupil Work

Children are taught a variety of methods to record their work and are encouraged to use the most efficient method to record. As well as mental calculations, children are taught to record using formal written methods and aspects of investigations using an efficient, appropriate method as set out in the calculation policy. Presentation is important and all the children are encouraged to make sure their work is neat and tidy.

Resources

A variety of practical resources are available to assist teachers and teaching assistants in school. Each class will have the appropriate year group set of Abacus maths books and teacher copies of Target your Maths and Maths No

Problem. Practical resources for each class include Numicon, place value counters, Cuisenaire rods, Dienes blocks and place value sliders. Extra mathematics resources are available in room 5.

Problem solving cards to stimulate mathematical thinking include the Making maths connections sets, what's the same, what's different sets, graded problem-solving sets and Maths comprehension sets can also be found in room 5. Other resources include Keen Kite, Headstart Reasoning and Problem solving and Rising Stars resources.

Staff Development

Teachers are required to keep up to date with subject knowledge and use current materials that are available in school or online.

Training needs are identified as a result of whole school monitoring and evaluation, performance management and through induction programmes. These will be reflected in the School Development Plan. The Maths subject leader will arrange for relevant advice and information, such as feedback from courses or newsletters, to be disseminated. Where necessary school-based training may be organised or led by the Maths subject leader.

Additional adults who are involved with intervention programmes will receive appropriate training that may be school based or part of central training. Where possible, maths courses are attended as appropriate.

Staff Roles and Responsibilities

The class teacher is responsible for the teaching and learning of Maths within the classroom. Teaching assistants are used to support individuals or small groups of children as required and identified within each class. The Senior Leadership Team assesses the needs of colleagues to assist in the planning of the curriculum through the School Development Plan and staff CPD. The Maths Subject leader purchases Mathematical equipment and ensures that the curriculum area is well resourced. Resources are stored in Room 5. Maths Subject Leader folders can be found in the staff room.

Calculation Policy

A visual calculation policy linked to the White Rose Maths hub is shared with staff and supports the CPA approach to maths (this is also available on school's website).

Multiplication Tables Check

In line with Government policy, children in Year 4 will be required to sit the Multiplication Tables check from June 2021 to determine their ability to recall tables fluently. This is to assist them with future success in mathematics.

Reporting to Parents

Reports are completed before the end of the summer term and parents are given opportunity to discuss their child's progress on three separate occasions throughout the year. Information is gathered from weekly assessment and test results to help teachers comment on the progress made by individual children.

Parental Involvement

During each term, we have developed open days where we invite parents into school to observe first hand a variety of lessons and how their children are taught. This is also a useful link for new parents to visit.

Parents are encouraged to come into school and work with children wherever possible.

Parent helpers often work with classes to bake or make a recipe or plant seeds in the garden based on their class topic.

The Governing Body

The Maths Subject Leader meets regularly with the Governor for Mathematics to discuss action areas within Mathematics. The subject Leader also attends Governor Meetings as required. Governors are invited in for maths monitoring days during the year.

Homework

It is LFJS policy to provide parents and carers with opportunities to work with their children at home. These activities aim to develop skills taught in class and are valuable in promoting children's learning in Maths. Homework is available online each week and follow concepts taught in class. It is necessary to help children to develop fluency and rapid recall.

Reviewed: July 2021