

LARKFIELD



PRIMARY SCHOOL

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MATHEMATICS POLICY & GUIDANCE

A.Blakely Autumn 2015

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Larkfield Primary School Mathematics Policy and Guidance Document (2015)

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 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)

Aims and Objectives

At Larkfield Primary School we aim to develop mathematicians who have:

- A positive attitude towards mathematics
- Competence and confidence in mathematical knowledge, concepts and skills
- The ability to calculate fluently
- An ability to solve problems, to think logically and to work both systematically and accurately
- The ability to reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- Initiative and an ability to work both independently and in cooperation with others
- An ability to communicate mathematics effectively
- An ability to use and apply mathematics across the curriculum and in real life

Good mathematics is not about how many answers you know...It's how you behave when you don't know

- Author unknown

Planning and Teaching Guidance

The content and objectives that form the basis of our planning are taken from the statutory National Curriculum for England. In line with the aims of this document and those of our school, teachers will plan and deliver mathematical activities which will enable pupils to understand concepts at greater depth and to solve a range of non – routine problems.

Teachers' planning will focus upon the objectives for their year group and the expectation will be that most of the children will progress through the objectives at broadly the same pace. However, where necessary, adaptations will be made to the curriculum, to equipment and to resources to allow access to maths for pupils with SEN and those with significant gaps in their learning. In addition, teachers will provide an opportunity to

explore learning at even greater depth for pupils who are very able in mathematics. These pupils will not, however, be rushed onto considering the content from the year group above.

Planning should provide the children with a range of opportunities to apply their knowledge through non - routine activities. These could be putting work into purposeful real life contexts or by enriching and deepening knowledge through seeking solutions, exploring patterns and formulating conjectures.

Problem solving will be an integral part of weekly plans. Skills should be explicitly taught so that the children can then go on to tackle the problems independently. All 5 areas of problem solving should be covered over the course of an academic year – Word problems, Finding all possibilities, Logic, Describing rules and patterns and Visual puzzles and diagrams.

The Calculation Policy set out by The NCETM provides the progression for the teaching of written calculations in our school. It is imperative that children gain a clear understanding of the calculations that they are performing and are not simply taught to follow a set of rules. The policy will be used in conjunction with The NCETM guidance document. (October 2015) This will ensure that children are given the opportunity to develop a greater understanding of the calculations that they are engaged with through activities such as intelligent practice.

Counting should form a key part of every mathematics lesson. Children should continue to develop their ability to use mental methods of calculation. As they develop their understanding of Mathematics they should become increasingly adept at deciding whether a written or mental method of calculation is the most appropriate to use in a given situation.

The Use of Concrete Resources In Teaching Mathematics

Regardless of the level the children are working at, Mathematics teaching should, where possible, follow Bruner’s theory of learning. This suggests that concepts should be introduced using concrete materials before moving onto pictorial representations and finally considering the use of using symbols.

Concrete \longrightarrow **Pictorial** \longrightarrow **Symbolic**

The use of Bruner’s theory of learning supports the development of the children’s ‘number sense’. Having an understanding of the quantity value of numbers is vital for approximating and checking an answer and truly understanding mathematics. Children need plenty of experience of seeing the size of numbers using concrete resources and experience of manipulating numbers in a variety of ways in order to develop their number sense.

During the teaching of Mathematics lessons, teachers will utilise a wide variety of practical apparatus. This will include, amongst other things, Base 10 equipment, Numicom, Coins and

Counters. Such apparatus will be of fundamental importance to the success of the teaching. However, it is important to remember that it is not the equipment itself which will make the difference to the understanding of the pupils but the skill with which the teacher makes use of it,

Vocabulary and Spoken Language

The National Curriculum for Maths reflects the importance of spoken language in pupils' development of the subject. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. Children must be assisted in making their thinking clear to themselves as well as others and teachers should ensure pupils build secure foundations by using discussion to probe and remedy their misconceptions. Indeed, children should be encouraged to **mathematically mutter** during lessons.

Children should be encouraged to use models and images to support their thinking and to develop their ability to talk about their work. Asking the children to "say what they see" and "write what they say" will support the children with clear links between the models and images and their written work. Children will be expected to prove their answers using models and images and spoken language as a way of checking their own and each other's work.

Vocabulary linked to the current topic should be displayed and referred to during lessons.

Developing Enjoyment and Confidence

In order to develop confident Mathematicians we must set the expectation that errors are welcome and part of learning. Teaching should encourage creative answers by giving lots of open ended questions that don't require a single answer and expect the children to think creatively and to give answers that no-one else has thought of. This way of questioning will also help reduce anxiety around mathematics.

*Anyone who has never made a
mistake has never tried
anything new
- Albert Einstein*

ICT

ICT should be used where it can enhance Mathematics teaching. It can demonstrate and model ideas to develop conceptual understanding. It can be used to present alternative representations and images and to test ideas. The use of ICT should allow dialogue between

the teacher and children or between children with their peers. Once again, it is not the ICT itself that will make the difference but the skill of the teacher in deploying its use effectively.

Cross – Curricular Teaching

Time will be set aside, on a daily basis, for the discrete teaching of Mathematics. However, the subject can also be linked to many other areas of the curriculum. When planning for learning in other subjects, teachers should exploit opportunities to provide pupils with further mathematical learning opportunities.

Intervention

So that children are able to meet the demands of the new curriculum, interventions in Mathematics will need to be both rapid and flexible. Children who have struggled to grasp concepts during the course of a teaching session will require additional support as quickly as possible so that they are able to access the content of the next day's learning.

Assessment

Assessment in maths is viewed as part of the learning cycle (Review/assess, teach, practise, apply). Learning objectives and steps to success are shared with the children. Children are provided with opportunities for self/peer-assessment and improvement. Marking is developmental and children are provided with next steps to extend their learning, in accordance with the marking policy. Teachers monitor the acquisition of skills, knowledge and understanding through appropriate teacher intervention, observations and discussions with groups and individuals, and records of objectives met by children are kept by the teacher and used to set future targets. All marking and assessment should be completed in line with school policy.

Resources

High quality resources suggestions;

Numicon

BEAM

<http://nrich.maths.org/>

National Strategies - Numbers and Patterns: Laying the Foundations in Mathematics

[http://www.foundationyears.org.uk/wp-content/uploads/2011/10/Numbers and Patterns.pdf](http://www.foundationyears.org.uk/wp-content/uploads/2011/10/Numbers_and_Patterns.pdf)

National Strategies - Securing levels 1-5 in Mathematics

http://www.edu.dudley.gov.uk/numeracy/assessment/securing_level.htm

National Strategies - Overcoming barriers in Mathematics

http://www.edu.dudley.gov.uk/numeracy/intervention/overcoming_barriers.htm

National Strategies – Pitch and Expectations

<http://www.suffolklearning.co.uk/3-11-learning-teaching/mathematics/planning/pitch-and-expectations>

National Strategies – ‘Problem Solving with EYFS, Key Stage 1 and Key Stage 2 Children. Finding All Possibilities’

<http://www.edu.dudley.gov.uk/primary/Strategymaterials/PNS/Problemsolving/Finding%20all%20possibilities.pdf>

National Strategies – ‘Problem Solving with EYFS, Key Stage 1 and Key Stage 2 Children. Finding All Rules and Describing Patterns’

<http://www.edu.dudley.gov.uk/primary/Strategymaterials/PNS/Problemsolving/Finding%20rules%20and%20describing%20patterns.pdf>

National Strategies – ‘Problem Solving with EYFS, Key Stage 1 and Key Stage 2 Children. Logic Problems and Puzzles’

<http://www.edu.dudley.gov.uk/primary/Strategymaterials/PNS/Problemsolving/Logic%20problems.pdf>

NNS 'Mathematical challenges for able pupils'

http://www.bgfl.org/bgfl/custom/files_uploaded/uploaded_resources/12212/mathspuzzles_all.pdf