# Newhall Primary Academy and Nursery

*"Aiming high; Reaching higher"*

# Maths Policy

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| Audience: | Parents<br>School staff<br>Local Governing Bodies |
| Approved: | May 2018 |
| Other related policies: | All policies |
| Policy owner: | Newhall Primary Academy |
| Policy model: | Newhall |
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**Honesty Respect Responsibility Resilience Aspiration Reflection**

At Newhall Primary Academy, we aim to inspire all children to reach their full academic potential. In Mathematics, this means ensuring a curriculum that is fully inclusive of all children, which allows learners to: hone skills and methods; think critically; and provides opportunities for them to communicate their understanding. Children are provided with chances to use their mathematical skills in a variety of contexts across the curriculum.

Mathematics is a powerful, universal language used to explain, predict and represent events as well as to tackle everyday problems; Mathematics is of central importance to our modern society. It is an essential part of everyone's daily lives and critical to science, technology, finance and engineering. Mathematics is necessary for any employment and independent life beyond education.

## Aims

The aims of Mathematics teaching at Newhall Primary Academy are aligned with the goals of the National Curriculum: **fluency, reasoning** and **problem solving** – both in the mathematics lesson and across the curriculum. We recognise that pupils need to learn basic number facts and acquire **fluency in procedures**, alongside **developing conceptual understanding** to enable them to solve increasingly complex problems in life, and later in the workplace. With this in mind, the aims of this Mathematics Policy are:

- To provide opportunities for children to explore concrete and pictorial representations before moving onto abstract concepts.
- To provide a rich environment that promotes learning mistakes.
- To equip children to solve problems by applying prior knowledge.
- To promote enthusiasm and enjoyment for learning through exciting teaching and learning opportunities.
- To develop logical thinking, reasoning and problem-solving skills through natural curiosity and investigative approaches.
- To develop a thorough knowledge and understanding of numbers and the number system.
- To encourage a range of strategies to solve problems including bar-models.
- To understand the importance of mathematical skills in everyday life.
- To maintain high expectations for all learners within mathematics.

## Maths No Problem at Newhall Primary Academy:

Maths No Problem is a company that has embedded the Singaporean approaches to teaching Mathematics within textbooks, workbooks, resources and training for teaching staff. At Newhall Primary Academy, resources have been purchased to support both teachers and children. The Maths No Problem mission statement is as follows: "We believe that every child can master an understanding and love of maths with the right kind of teaching and support. We want you to join our mission to build the confidence of the nation's maths teachers and learners." *Maths No Problem (2016).*

We believe Maths No problem will support us in continuing to build confidence with Mathematics teaching and learning across the school. Teachers have been provided with high quality text books, teaching resources and external professional development that have all been based on the transformational teaching methods developed in Singapore. At Newhall Primary Academy, teachers

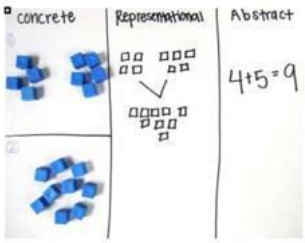
are encouraged to use the resources to suit the needs of their class, making appropriate provision adjustments as necessary. Pupils are provided with workbooks that contain questions that are aligned with the national curriculum to challenge learners within each year group (Year 1 – 6).

## A Mastery Approach

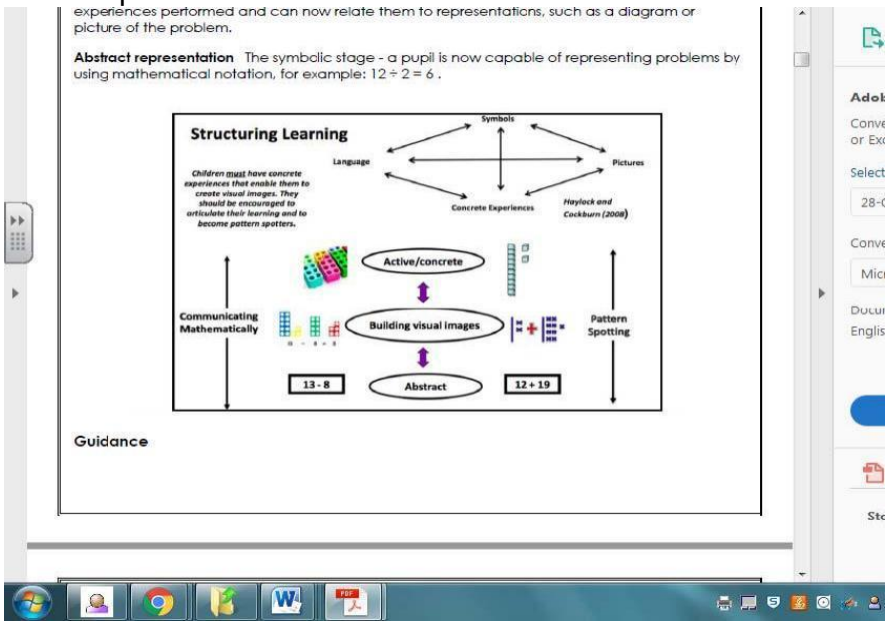
A mastery approach to the teaching of Mathematics has been adopted, to enable high expectations of all our pupils. Staff at Newhall primary Academy endeavor to make the Mathematics curriculum accessible to all pupils, moving them through the programme of study at broadly the same pace. All children need a deep understanding of the Mathematics that they are learning; this will ensure that future learning is built upon firm foundations. To support this a slower pace is adopted which has proven to result in greater progress and understanding of concepts. The Mastery Approach includes same day 'catch up' sessions and additional practice to help prevent children falling behind. Within this approach children develop their fluency in Mathematics without rote learning. Research suggests that pupils develop a deep, long term and adaptable understanding of Mathematics through mastery approaches.

## Concrete – Pictoral – Abstract

Newhall Primary Academy are using CPA approaches within all key stages; this is recognised as a highly effective approach that supports the understanding of Mathematical concepts. The approach is based upon research by psychologist Jerome Bruner (1960) and suggests that these three stages are necessary for pupils to develop understanding of a concept.




Using concrete resources allows opportunities for informal play/exploration to occur; this is supported by Zoltan Dienes' (1969) theory. This takes place at the beginning of all learning as it gives pupils the opportunity to investigate a concept first and then make connections when formal methods are introduces through teaching. Within pictorial stage the pupil will need to draw representations (e.g. dienes, numicon or place value counters); this is to reinforce the concept being taught. The abstract stage often runs alongside the concrete and pictorial stage as children will need to read mathematical statements and use the concrete resources or pictorial representations to show their understanding.




At Newhall Primary Academy, teachers use this approach based upon their understanding and love of maths with the right kind of teaching and support.

## Growth Mindset

The Mastery Approach in Mathematics also includes adopting a '**growth mindset'** which is essential for learners to be successful. Children at Newhall Primary Academy are encouraged to believe they are all capable of learning and succeeding in Mathematics, given sufficient time, good teaching, appropriate resources and effort.

**Growth Mindset features:**

- Everyone can learn Mathematics to the highest levels.
- Mistakes are valuable.
- Questions are important.
- Mathematics is about creativity, pattern spotting and sense making.
- Communication and making connections are vital components of Mathematics.
- In Mathematics lessons, the focus is more on depth of understanding than speed.

## Planning

Weekly lesson plans are annotated and saved in a planning file on the school system, along with required resources. The daily lesson plans include the teacher and teaching assistant's focus within each part of a lesson to ensure effective differentiation for learners. Teachers, in each year group, have been provided with resources to support planning Mathematics at greater depths, including textbooks, workbooks, online resources, practical resources, games and software.

Mathematics in Foundation Stage is a practical, activity-based subject both indoors and outdoors. In Foundation Stage, Mathematics is planned by teachers, with a range of continual provision opportunities provided for children to access independently outside of discrete adult-led sessions.

## Mathematics Lessons

There are key aspects of Mathematics teaching in every classroom at Newhall Primary Academy:

- Positive attitudes towards Mathematics and a sense of excitement.
- Mathematical skills being practised and applied across the curriculum.
- A mathematically rich environment that supports learning.
- Adults skillfully questioning children to reveal misconceptions, which are addressed.
- Children are challenged through rich and complex problems.
- Scaffolding is provided for children when required.
- Regular assessments identify children who require support; this is acted upon by teachers.

Children are generally taught in classes, not setting groups in line with the mastery approach. Lessons are structured with assessment opportunities throughout; these may be referred to as mini-plenaries. This provides opportunities to evaluate what has been learnt, review success criteria and address misconceptions. It should also provide opportunity for peer/self-assessment so children understand what they attained and where to go next. There are no specific time limits for the different parts of a lesson or a pre-determined format; however, quality Mathematics lessons should include:

- Highly focused lesson design with sharp objectives.
- High demands of pupil involvement and engagement with their learning.
- High levels of interaction for all pupils.
- Appropriate use of teacher questioning, modelling and explaining.

- An expectation that pupils will accept responsibility for their own learning and work independently.
- Regular use of encouragement to engage and motivate pupils.
- An emphasis on learning through dialogue, with regular opportunities for pupils to talk both individually and in groups.

## Mathematics Working Wall

It is expected that all classrooms will have a Mathematics Working Wall. This is an interactive display board to show the process of Mathematics and the learning journey within the current unit of work. This board is regularly changed to reflect the teaching and learning activities happening in the classroom. This display should include dated materials to support children (e.g. models and success criteria) when accessing their independent tasks. Mathematics working walls are clearly visible and provide the children with key vocabulary, number lines and charts, 100 squares, number facts, prompts and challenges that are appropriate for the unit of work.

## Mathematics Assessment

Children's Mathematics workbooks, Mathematics journals and assessments provide evidence of progress and attainment. Learning is recorded in as many ways as possible to provide the children with a range of experiences e.g. photographs, pupil reflections, observations, collaborative learning strategies, evaluations and unit reviews. Targets to support children's end of year outcomes are set and worked on within Mathematics Journals. Teacher assessments are based upon the practical, written and oral work completed by the children.

There are a number of different styles of assessment in our mathematics curriculum:

- Formative – on a daily and weekly basis, teachers monitor progress and learning to ensure the children are understanding their new learning before moving on. This informs future planning, providing challenge and support where necessary. Assessment tickets are shared with children and updated regularly by teachers.
- Half-termly assessments – teachers use their knowledge of each child and evidence gained to make individual judgments for each child's Mathematical ability. As part of this, children complete a PUMA test based upon targets for the year group they are working within.
- KS1 SATS – at the end of year 2, teachers are required to submit assessment levels in Mathematics to the local authority on each child.
- KS2 SATS – at the end of year 6, children complete 3 Mathematical test papers (1 arithmetic paper and 2 further papers based upon the child's ability to reason), that assess the children's understanding of the Key Stage 2 curriculum. The class teachers also submit their judgment of the children's attainment termly with the support of summative assessments.

## Cross-curricular Learning

Although Mathematics is taught as a discrete subject, staff are encouraged to exploit any cross-curricular links and provide opportunities for children to demonstrate their knowledge of concepts

or skills in other subjects such as:

**English:** Mathematics contributes significantly to the teaching of English with children being encouraged to read and interpret mathematical problems. Speaking and listening is also a key feature as children are encouraged to work in groups and share their ideas. Writing within Mathematics is strongly encouraged at Newhall Primary Academy with reflections and evaluations becoming a key part of a child's mathematical learning journey.

**Computing**: Children use and apply mathematical skills in a variety of ways when using ICT. Younger children use ICT to learn about positional vocabulary by directing and controlling the Beebots. They also present information using mathematical symbols. Older children present information related to data handling through computer programs such as Excel. When Key Stage 2 children work with programming software (e.g. Scratch), they use units of measure for distance and angles. All Key Stage 2 children have access to Mathletics, to further support their learning.

**Curriculum for Life**: Through paired and group work in Mathematics, children are encouraged to value others, their contributions, thoughts and take responsibility for their own learning.

## Challenge by Choice

Derived from our 'learning without limits' research and approach, children are trusted to direct their own learning and choose challenges for themselves; therefore, they will hold accountability for these choices. Opportunities for challenge by choice learning occur regularly at Newhall Primary Academy.

## Homework/ Parental Involvement

Appropriate homework activities are set for each year group. From Year 3, homework is set via Mathletics (an online resource), which children should be using regularly (approximately once per week). Teachers will also set other home learning tasks.

Newhall Primary Academy encourages parents to be actively involved in supporting their children's mathematical ability. This can be through daily counting, learning number bonds, recalling multiplication and division facts as well as talking through their mathematical understanding. There have been developments in the strategies taught in schools; therefore, parents are able to access these strategies on the school website via the Mathematics page and the Mathematics Calculation Policy.

## Special Educational Needs/Gifted and Talented

We aim to provide a rich mathematical education, which will develop the potential of all pupils regardless of race or gender. Children who regularly grasp concepts rapidly are provided with extension activities to deepen their understanding for their year groups learning objectives. Planning for these pupils will focus on enrichment prior to acceleration as well as the development of mathematical thinking rather than covering content more quickly. Teachers are equipped to provide challenging and stimulating problems along with probing questions. More confident mathematicians have the opportunity to take part in challenges within the Harlow community during the school year.

Appropriate adjustments are made for children with special educational needs if required (as

guided by SENCO). Any child who is assessed to have special education needs in Mathematics will have a Mathematics target on an individual basis. Outside of the lessons, some children are provided with additional support through one to one work or small group work with a teacher, learning support assistant or higher-level teaching assistant.

## Leadership and Management of Mathematics

The Maths Coordinator works in conjunction with the S.L.T. The role of the subject leader involves:

- modelling good practice;
- being responsible for the upgrading and ordering of resources and arranging for their storage;
- keeping informed about developments and new initiatives to support the teaching of Maths and ensure staff are informed;
- auditing needs and organise staff training;
- training staff in teaching and learning of Maths;
- monitoring progress on a regular basis and feeding back to the head teacher;
- supporting teachers in planning and using resources;
- updating the school policy when necessary.
- ensuring Year 6 children are fully prepared for their national end of year assessments.
- liaising closely with the assessment leader.

## Governing body

Each term, the governing body is informed of the achievements and progress in Mathematics throughout the school. The Mathematics Subject leader is responsible for keeping the governing body up to date with new initiatives and developments.

## Budget

Money is allocated every year from the school budget to ensure the maintenance and improvement of stock. Extra money is made available to direct to specific School Improvement Plan initiatives relating to Mathematics.