

Isaac Newton Primary School

Mathematics Policy



This policy outlines the teaching, organisation and management of mathematics taught and learnt at our school. The purpose of this policy is to ensure that all staff are able to implement the teaching of maths to a high standard in order for our pupils to achieve to the best of their abilities.

It has been developed by the Mathematics Subject leader and is based upon the new National Curriculum for mathematics.

Context

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.

Aims

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 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.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

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.

Provision

The programmes of study in the National Curriculum form the content of the school curriculum for mathematics and the activities, which children undertake are planned from these. Each objective is broken down into small steps to support the build-up of skills. This helps ensure there is an appropriate pace, progression and coverage of the subject. The coverage is reviewed continually by class teachers and planning is adjusted accordingly to ensure appropriate coverage of all mathematical strands.

Lessons are taught through a concrete, abstract and pictorial approach. The Concrete Pictorial Abstract approach is a system of learning that uses physical and visual aids to build a child's understanding of abstract topics. Pupils are introduced to a new mathematical concept through the use of concrete resources. When they are comfortable solving problems with physical aids, they are given problems with pictures – usually pictorial representations of the concrete objects they were using.

Then they are asked to solve problems where they only have the abstract i.e. numbers or other symbols. Building these steps across a lesson can help pupils better understand the relationship between numbers and the real world, and therefore helps secure their understanding of the mathematical concept they are learning.

Each term children are given opportunities for:

- Practical activities
- Problem Solving
- Investigations
- Individual, paired, group and whole class discussions and activities
- Open ended questioning
- Using ICT where appropriate
- Learning through mathematical games
- Development of mental strategies and consolidation of basic skills and number facts.
- Cross curricular links
- Presenting their work for a variety of purposes, such as to the teacher, to other pupils, in mini projects and for the school newsletter.

Since 2017 it has been apparent that progression in maths at Isaac Newton has needed increased focus. The school has changed the way in which staff ensure progress leading to a significant increase in the progress and attainment measure at KS2 in 2019. In order to maintain and improve on these gains the school has ensured that we are:

- Using concrete apparatus throughout school to support mathematical understanding through visual and kinaesthetic experience. This includes equipment such as Numicon, Base 10, Counters and Fraction Walls.

January 2020

- Changing the calculation policy throughout the school to ensure that teachers have a clear and consistent framework to follow. The calculation policy now makes it very explicit that the school will use a concrete, pictorial and abstract approach.
- Moving away from setting in KS2 in order to prevent a ceiling of achievement
- Ensuring all teachers follow the National Curriculum objectives for the year group they teach. These objectives are broken down into the small steps framework to help build up skills over a period of time. Teachers are also to be aware of the year group below and above their own, to ensure they are confident with where the children have come from and what the expectations are for the following year.
- Ensuring teachers understand the complexity of Greater Depth in Maths and that this level of challenge is provided for children throughout lessons.
- Ensuring teachers provide all children with frequent opportunities within lessons to reason and problem solve.
- Using a 'Flashback 4' type approach to ensure that concepts are regularly re-capped and re-visited. This should be done briefly at the start of a lesson or at another time during the school day. This activity is based on recapping concepts from yesterday, last week, last month and last year, it can also be used as an assessment opportunity.
- Providing teachers with access to high quality resources from the 'Maths Hub' to support with the planning and delivery of lessons.

These measures are constantly monitored through our assessment system to ensure that they are not simply tenuous changes but have a direct correlation to attainment and outcomes.

ICT & calculators

Calculators should not be used as a substitute for good written and mental arithmetic. They should therefore only be introduced near the end of key stage 2 to support pupils' conceptual understanding and exploration of more complex number problems, if written and mental arithmetic are secure. Teachers should use their judgement about when ICT tools should be used.

Differentiation and Support (inc. provision for SEN, G&T, EAL, PP pupils)

This is incorporated into all mathematics lessons and is done in various ways, such as:

- Setting challenging age related tasks
- Small differentiated target steps for all children to move through at a pace that suits their needs
- Timely support and intervention
- Ensuring marking and constructive feedback is personal, frequent and of a consistently high quality
- Range of practical-real life resources used to support all stages of learning
- Intervention programmes/ extra teacher support delivered where needed both in class and through extra sessions
- Visual stimulus/aids are provided for our hearing impaired and EAL pupils
- TA support time which is planned and provided in relation to identified needs for individuals and groups

Homework

Homework is used where appropriate to reinforce a particular topic in both KS1 and KS2. This allows them to share some of their mathematical working with their family.

Children are expected to undertake daily practise of their mental skills at an appropriate level.

Foundation/Early Years

Mathematics is taught in both Foundation stage classes and is guided by the requirements and recommendations set out in the Early Years 'Development Matters' EYFS document. All children are given plenty of opportunities to develop their understanding of mathematics, through adult led and child-initiated activities each day. These activities encourage the children to use, enjoy, explore, practise and talk confidently about mathematics. Number activities are supported by a range of resources such as Numicon.

Assessment

Assessment is regarded as an integral part of planning, teaching and learning and is a continuous process. It is the responsibility of the class teacher to assess all pupils in their class. This is achieved through mini-plenaries, questioning, marking, TA feedback, pupil self-assessment and peer assessment.

In our school we are continually assessing our pupils and recording their progress. We see assessment as an integral part of the teaching process and strive to make our assessment purposeful, allowing us to match the correct level of work to the needs of the pupils, thus benefiting the pupils and ensuring progress.

Longer term assessment will take place at various points throughout the year to assess and review pupils' progress and attainment. These will be made through compulsory National Curriculum tests for pupils in years 2 & 6. Star maths assessments will be used in years 2-6 and these can give standardised scores to show progress. In year one children are teacher assessed against the national curriculum objectives.

Tracking

Continual tracking of progress enables teachers to have a clear understanding of how their class are progressing and where development is needed. All children are tracked on the school database (Integris) using teacher assessments. A child can therefore be tracked over the year or to be tracked back over previous years. The database is also used to monitor the progress of children towards their targets. It helps to identify individuals who are not on track and need further intervention or support.

Parental links

At Isaac Newton Primary School we encourage parents to be actively involved in their children's mathematical learning both in school and at home. We get parents involved by:

- Encouraging children to share homework with parents/carers
- Inviting parents into school twice a year to discuss the progress of their child.
- Sharing information through annual reports
- Mathematical links on the school website, e.g. – calculation policy
- Allowing children who are using 'Timestables Rockstars' to access this at home. We regularly run competitions and put information about this in the school newsletter.

Monitoring and Review

The monitoring of the standards of children's work and the quality of learning and teaching mathematics is the shared responsibility of the SLT and the subject leader. The work of the subject leader also involves supporting and guiding colleagues in the teaching of mathematics, developing and updating their skills, knowledge and understanding, being informed about current developments in the subject and advising of appropriate training opportunities.