



Mathematics Curriculum Policy

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Monega Primary School Mathematics Policy

The curriculum for Mathematics is progressive and demanding. A displayed progress journey at the beginning of lessons enables pupils to rehearse, overlearn and deepen their learning by making connections.

Our clear approach to lesson sequencing ensures that lessons build upon each other. This, in turn, ensures that all pupils make exceptional progress. The building blocks, or core components, of lessons ensure that children are ready for subsequent learning, giving them the best opportunity to know more and remember more.

At Monega Primary School, we believe that:

'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.'

(The National Curriculum in England Framework Document (DfE) 2014)

We ensure that our teaching centres around the revised National Curriculum and with the application of the new programmes of study and attainment targets. We understand that 'the National Curriculum provides pupils with an introduction to the core knowledge that they need to be educated citizens.'

Our well-balanced curriculum promotes the spiritual, moral, cultural, mental and physical development of pupils and prepares them for the opportunities, responsibilities and experiences of later life. We will develop pupils' spoken language, reading and writing in all subjects and will develop pupils' mathematical fluency.

We wish to work closely with the School Council and to hear their views and opinions as we acknowledge and support Article 12 of the United Nations Convention on the Rights of the Child: that children should be encouraged to form and to express their views.

We as a school community, have a commitment to promote equality and to this end, teachers consider carefully when planning lessons, the impact of visuals, models and scenarios they present to pupils as well as making links to the UN's Sustainable Development Goals.

Aims

At Monega, our intent for mathematics is to teach a rich, balanced and progressive curriculum using Maths to reason, problem solve and develop fluent conceptual understanding in each area. We want the children to see the importance of maths, how much we use maths skills in everyday life and its world-wide application.

In order to achieve this, we work hard 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.
- All pupils reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language;

- All pupils 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;
- All pupils are encouraged to develop an enthusiasm for and fascination with mathematics;
- Teachers increase the confidence of each pupil in mathematics to enable them to apply the knowledge and skills with assurance;
- We promote the teaching of Maths and English within all subjects;
- We share good practice within the school and work with other schools to share good practice in order to improve standards.

Teaching and Learning Style

The rationale behind our approach to teaching mathematics lies within the NCETM Maths Hub Programme as well as the 2014 National Curriculum, which states:

- *The expectation is that most pupils will move through the programmes of study at broadly the same pace.*
- *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.*

We strive to ensure that Fluency, Reasoning and Problem solving, the three key aims of the National Curriculum, is addressed in each sequence of learning. Children have the benefit of understanding why formulas work, instead of just applying them. We aim to contextualise Maths in lessons, so that the children understand the links between the mathematics that they learn in school and how to use Maths in real life. Through our Oracy in Context lessons, we try to show that mathematics is not an isolated subject, by linking learning to the practical matters of the real world around them. This leads to a deeper form of learning and longevity in retaining this knowledge.

An emphasis is also placed on the Concrete-Pictorial-Abstract approach in our Mathematics curriculum. Research in Learning from key theorists (such as Dienes, Bruner, Vygotsky, Skemp and Piaget) in education is heavily referred to in promoting students' positive attributes to learning. The following are fundamental in ensuring that such key aspects are being delivered daily in the classroom:

- Opportunities for students to interact with their peers (Vygotsky)
- Concrete activities
- Exploration (Piaget)
- Safety of learning environment (Promoting 'productive failure' - learning from mistakes)

Pupils at Monega develop their reasoning skills through the Explanation and Reasoning element of daily lessons. In this way pupils get to hone their thinking skills, applying this to process such as classifying, comparing, analysing parts and whole identifying patterns and relationships, deduction generalising and spatial visualisation.

Pupils are taught to explore strategies they can use to tackle a problem when the solution to the problem is not obvious. These include using a representation (e.g., drawing a diagram, tabulating) making a guess (e.g., trial and improvement/guess and check making a supposition), walking through the process (e.g., acting it out, working backwards) and changing the problem (e.g., simplifying the problem, considering special cases).

We ensure that all pupils are taught from their specific starting point in relation to a concept and that all abilities have the opportunity to deepen their learning and be challenged.

Key approaches to learning:

Learning is about making connections:

- **The spiral curriculum** (curriculum approach) - connecting to extend existing knowledge and skills;
- **The Concrete-Pictorial-Abstract (C-P-A)** development of concepts (pedagogical approach) that connect to make sense of learning;
- **Learning experiences** (Learning approach) - connections to realise the curriculum

The Teaching and Learning of Mathematics at Monega should be reflective of these key principles and provide daily opportunities for these connections and skills to be taught. Such skills are reinforced, embedded and developed further in order to be used and applied in different contexts. In this way, pupils become independent mathematical learners who are encouraged to reason and explain their learning.

Planning

In Key Stage 1 and Key Stage 2, teachers plan together using our bespoke curriculum overview based on the National Curriculum 2014. The curriculum overview is organised within the four operations of number (Numerical reasoning; Additive reasoning; Multiplicative reasoning and Geometric reasoning). These skills are to be taught over a 3-to-4-week block with frequent opportunities to use and apply within varying contexts such as measure and statistics.

Long term planning: is based on Monega's Whole School overview in Mathematics. The concepts to be taught and covered are listed accordingly.

Medium-term planning: are the objectives and concepts that are set out in the 'Securing Progression in Mathematics'. Teachers select the objectives and concepts that fit with the topic that is outlined in the overview and ensure that the targets are broken down into child friendly objectives that are seen to be progressive in its learning journey over the week.

Short term planning: is carried out on a weekly basis. All planning includes a skills-based learning objective with succinct success criteria, an anchor task, a progressive teaching sequence which incorporates a fluency starter, an explanation and reasoning element, Key AFL strategies, key questioning, relevant vocabulary and resources. Teachers should have high expectations of their pupils and must ensure that work is appropriately challenging and engaging. Teachers should make explicit to the pupils the objectives, success criteria and expectations for the lesson which must be displayed on the board and referred to before any lesson commences.

As learning is facilitated by the use of ActivInspire flipcharts, this is regularly monitored by SLT and Subject Leaders, who offer support where needed. Regular analysis of these flipcharts allows feedback in time for the subsequent week's planning session and expectations are that any areas of weakness will be addressed in succeeding flipcharts/resources.

Maths and Special Educational Needs (SEND)

At our school we teach mathematics to all children, whatever their ability. Mathematics forms part of the school curriculum policy to provide a broad and balanced education to all children. Through our mathematics teaching we provide learning opportunities that enable all pupils to make progress. We do this by setting suitable learning targets and responding to each child's different needs in consultation with the SEND Inclusion Manager. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels. If a child's needs are

particularly severe, they will work on an individualised programme written in consultation with the appropriate staff.

Teaching styles should be interactive allowing for pupil participation. A combination of open and closed questioning should also be used by teachers which allow all pupils to participate in the lessons. When planning, teachers will try to address the child's needs through simplified or modified tasks or the use of support staff.

English as an Additional Language (EAL)

Everyday classroom practice at Monega is tailored to account for the needs of pupils for whom English is an Additional Language. All staff members are aware of the need to use a range of strategies on a regular basis that are identified as increasing curricular access for EAL pupils (see Appendix A).

It is expected that teachers will regularly listen to children read through objective-led Guided / Shared Reading sessions. These objectives are a progressive development through the necessary reading levels and are found in the teacher's digital Class Reading Records. These levels will form the basis of the teacher's Teacher Assessment which are recorded on SIMS. These assessments facilitate the development of Individual Pupil Targets that are issued to both children and parents.

Moderation of Teacher Assessment is scheduled across the academic year to ensure consistency in approach and expectation. Additionally, opportunities to moderate across the Trust are being developed.

Monitoring of teaching within Monega is in accordance with the school's Monitoring Timetable. Both of the school's English Coordinators are involved in this process in collaboration with the school's Senior Management Team.

Resources

The use of Mathematics resources is integral to the concrete - pictorial - abstract approach and thus planned into our learning and teaching. We have a wide variety of good quality equipment and resources, both tangible and ICT based, to support our learning and teaching. These resources are used by our teachers and children in a number of ways including:

- a) Demonstrating or modelling an idea, an operation or method of calculation, e.g.: a number line; place value cards; dienes; money or coins; measuring equipment for capacity, mass and length; bead strings; the interactive whiteboards and related software; 3D shapes and/or nets; Numicon and related resources and software; multilink cubes; clocks; protractors; calculators; dice; number and fractions' fans; individual whiteboards and pens; and 2D shapes and pattern blocks, amongst other things;
- b) Enabling children to use a calculation strategy or method that they couldn't do without help, by using any of the above or other resources as required; and
- c) Providing a context for the application and practise of calculation strategies and number skills.

Standard resources, such as number lines, multi-link cubes, dienes, hundred squares, shapes, etc. are located within individual classrooms. Resources within individual classes are accessible to all pupils who should be encouraged to be responsible for their use. Further resources (often larger items shared by the whole school) are located in the Mathematics Room.

A range of Mathematics related software is also available and this is accessible via the shared drive, which children can access when projected onto the Interactive Whiteboards in each classroom; by using individual class-based laptops; or by using iPads.

Teachers are encouraged to use the school halls or playgrounds as an outdoor classroom, when possible, for example, when teaching length, area or perimeter.

Assessment

As soon as pupils are inducted into the school, they complete a baseline assessment. Progress in Understanding Mathematics Assessment (PUMA) tests the pupil's mathematical knowledge not their reading, writing or spelling ability. It provides the school with diagnostic information as well as a standardised score. PUMA assessments are carried out with the whole class at the end of each term.

Formative assessments are carried out by the teacher on a daily basis through use of effective questioning and incisive marking. At the end of each unit, pupils answer Pre-learning Question for the next unit of learning. In this way, teacher can assess whether pupils have the sufficient knowledge to progress in the next unit, or whether there are gaps in learning which need to be addressed first. These PLQ's also inform teachers of how to vary tasks for pupils in order for them to access the learning and make the best progress.

On a termly basis, assessment data is entered onto SIMs where the progress, strengths and weaknesses can be tracked and are informative for the next half term/term/academic year.

Data is analysed regularly by the Assessment Coordinator and Maths Leads. From this, areas for further development are identified and addressed through the use of whole-school, group and individual targets.

Target Setting

Children's performance is tracked by both the Maths Leads and the school's Assessment Coordinator. Collected data is then used to identify pupils who are making progress which is below the expected level as well as providing the basis for the development of whole-school performance targets.

Intervention is put in place for children who struggle to make sufficient progress.

All parents receive an annual written report on which there is a summary of their child's effort and progress in mathematics over the year. In addition to this, parents will also receive a half termly report card which provides information on the child's current level, the progress grade and the effort grade.

At the end of Key Stage 1 and Key Stage 2 each pupil's level of achievement against national standards is included as part of their annual written report.

The Learning Environment

Monega Primary School has created its own classroom environment checklist to ensure consistency and quality across the EYFs and both Key Stages and within all areas of the curriculum.

Intervention

Using the school's provision for tracking pupil achievement, the assessment coordinator, EMA coordinator, SENCO and class teachers are able to identify pupils who are not making the expected progress. Such pupils will then be identified for further support

-Years 5 and 6 receive additional support from HLTAs.

Maths Leads' Role

- To monitor, review and order resources;
- To plan and organise staff development in line with key priorities and with liaison with the school's CPD Co-ordinator;

- To review the school policy regularly;
- To encourage a Maths display in classrooms and around the school by providing a good role model;
- To monitor the delivery and assessment of Maths across the school in consultation with the Leadership Team, Senior Management Team and the school's Assessment Coordinator;
- To monitor pupil progress, identify whole-school/ layered/ individual targets in liaison with the school's Assessment Coordinator;
- To manage access and entitlement to Maths in school through consultation with the school's Assessment Coordinator, Ethnic Minority Achievement Coordinator, SENCO and Inclusion Manager;
- To involve LEA support services within the school and liaise with Maths Consultants;
- To maintain and identify priorities for the school;
- To ensure that Maths recommendations set within the SIP are met;
- To provide parents with updated information on Maths initiatives and the target setting process.

Monitoring the Effectiveness of the Policy

The practical application of this policy will be reviewed annually or when the need arises by the Maths Leads and the Headteacher.

Niroshinie Amarasinghe
Maths Lead
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