



## **Mission Statement**

Moorgate Primary Academy sees itself as at the heart of the community. We provide children with an enriched curriculum and extended opportunities to thrive and develop them into lifelong learners. This is encapsulated in our academy vision: Achieve, Challenge, Enjoy!

## **Purpose**

The purpose of this policy is to describe our practice in Mathematics at Moorgate Community Primary Academy and the principles upon which this is based.

## **Why do we teach Mathematics?**

Mathematics equips pupils with a uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem-solving skills, fluency and the ability to think in abstract ways.

Mathematics is important in everyday life, many forms of employment, science and technology, medicine, the economy, the environment and in public decision-making. Different cultures have contributed to the development and application of mathematics. Today, the subject transcends cultural boundaries and its importance is universally recognised. Mathematics is a creative discipline. It can stimulate moments of pleasure and wonder when a pupil solves a problem for the first time, discovers a more elegant solution to that problem, or suddenly sees hidden connections.

## **General principles**

Mathematics will be taught to all pupils throughout the Academy in ways appropriate to their ability. It will be taught as a single subject and will also be incorporated into our topics through cross-curricular work.

The Academy Equal Opportunities Policy applies to the teaching of Mathematics, as to all other subjects. All pupils will be encouraged to understand the importance of Mathematics as a key skill required for future life and will be expected to work to the limit of their abilities.

## **Aims**

Mathematics is a tool for life. To function in society, we all need to be able to communicate mathematically. We aim to ensure that our children leave the academy with high standards of mathematics as well as literacy.

### **In our teaching of mathematics at Moorgate, we aim to:**

- encourage an enjoyment and love of maths.
- ensure that all children attain expected mathematical skills by the time they leave in year six.
- enable pupils to have opportunities for mathematical thinking and discussion through investigation.
- provide opportunities for pupils to demonstrate and use their mathematics in real life contexts.
- provide a role-model by using mathematics for practical purposes, organisational and administrative tasks.
- help pupils to understand that mathematics is a powerful tool for communication.
- instil confidence at using mathematics.
- help pupils to be unafraid of and to be able to use new technology.
- help pupils recognise that a key aspect of mathematics is a search for patterns and relationships.
- instil a fascination for mathematics and the manipulation of numbers.

- encourage pupils to take responsibility for their own learning.

We are continually aiming to raise the standards of achievement of all of the pupils at Moorgate Primary Academy.

### **Planning and Delivery**

At least one hour a day is spent on mathematical activity. These activities are concerned with fulfilling and extending the requirements of the National Curriculum for Mathematics. Teachers follow the guidance set out in the Numicon Handbooks to plan sequential lessons. The activities may be taught to whole classes, year groups or ability groups.

The planning format is standardised through the academy and is completed every week. Planning is monitored by the senior leadership team on a proportionate timetable.

#### **All the children will have opportunities to:**

- work at their own ability level.
- work in pairs and in small and large groups.
- work in the areas of number, calculation,, fractions, geometry, statistics and measure.
- use a wide range of mathematical tools/instruments to support and develop their learning.
- rehearse mental arithmetic strategies and skills on a daily basis.

#### **The tasks or activities:**

- will bring together different areas of mathematics and links to topics being taught.
- will be balanced between those which develop knowledge, skills and understanding, and those which develop the ability to tackle practical problems.
- will constantly promote the use of mental calculation.
- encourage confidence in the use of mathematical tools.
- will involve both independent and co-operative work.
- will be both of the kind that have exact results/answers and those that have many possible outcomes.
- will encourage a positive attitude and enjoyment of mathematics.
- will be balanced between different modes of learning:
  - listening/looking (understanding explanations, instructions, questions, answers)
  - reading (using textbooks, work-sheets, reference books; comparing methods or solutions)
  - writing (making jottings; pencil and paper calculations; drawing sketches and diagrams; recording results; reporting on an investigation)
  - talking (oral work; describing; reporting; explaining; clarifying ideas; giving examples; predicting; questioning; discussion with teacher and-peers)
  - reflecting (considering approaches to problems; thinking about own work in relation to what has already been learned)
  - carrying out practical work (sorting; counting; measuring; constructing models; making a survey; etc.)
  - observing (spotting patterns; watching what is happening; noting similarities or differences; looking for consistencies or inconsistencies.)drafting (plotting a series of steps needed for a particular assignment)
- should help children to develop their personal qualities, including:
  - ❖ motivation and willingness to 'have a go'
  - ❖ flexibility and creative thinking

- ❖ perseverance. reliability and accuracy
- ❖ willingness to check, control and improve their own work
- ❖ independence of thought and action
- ❖ ability to co-operate within a group
- ❖ systematic work habits
- ❖ expectation to use a known fact to help work out unknown facts

Mathematics is used in other curriculum areas wherever possible or appropriate. This helps to expand and consolidate mathematical concepts and using maths in a purposeful way in everyday contexts helps the children to realise that mathematics is important in the real world.

A clear calculation policy is in place that shows the Academy journey through mental and written methods for the four operations. This is compatible with the new 2014 National Curriculum.

### **Medium Term Planning**

Teachers are supported with medium term planning outlined in the Numicon handbooks. The emphasis is to develop a sequence of teaching and learning that encompasses the cycle of assess, plan, teach, practise, apply, and review through every concept.

Each concept builds upon a particular mathematical area and these build upon each other throughout the academic year. Each concept is headed under a particular strand. These are;

- Numbers and the Number System
- Pattern and Algebra
- Calculating
- Measurement
- Geometry

This scheme provide teachers with exemplification for maths objectives and are broken down into fluency, reasoning and problem solving - the key aims of the National Curriculum. It supports a mastery approach to teaching and learning and has number at its heart. Numicon ensures that teachers stay in the required key stage and support the idea of depth before breadth. It also provides plenty of time to build reasoning and problem solving elements into the curriculum

### **Short-term planning**

- A standard pro-forma has been introduced and is used by staff to plan learning over a series of lessons.
- These plans must include learning challenges, success criteria, outline activities for a review, whole class teaching focus, guided group work, independent tasks, differentiation (age-related through questioning and scaffolds), key vocabulary and STEM sentences.
- Planning clearly shows which group the teacher will be focusing on each day and which group will be supported by the Learning Support Assistant.
- Teachers evaluate units of work, making notes on pupils who have exceeded or not achieved expectations against the success criteria for every lesson.
- Teachers design tasks which are low entry but have a high threshold. This ensures that all of the children are accessing age-related mathematics and can be challenged by going 'deeper' into a concept rather than being rushed onto new material.
- Short-term planning is supplemented by Numicon Pupil Handbooks in KS2, which enable teachers to provide high quality mathematical structures, problems and reasoning opportunities to the children.

### **Cross- curricular links**

Mathematics is taught mainly as a separate subject but every effort is made to link maths with other areas of the curriculum. We try and identify the mathematical possibilities across the curriculum at the planning stage when beginning a new topic. We also draw children's attention to the links between maths and other curricular work so children see that maths is not an isolated subject.

### **Classroom Organisation and Expectations**

Classroom organisation for mathematics will be such that the children are encouraged to show independence in choosing the resources/materials needed for a task and to promote self-motivation/organisation.

#### **We will endeavour to:**

- ensure the environment is stimulating and supportive
- create challenging activities in which children can experience success
- value the achievement of each child
- build upon the knowledge and skills which children have gained formally and informally
- give the children mathematical experiences which match their ability and stage of development, are structured and maintain a good pace
- organise both collaborative and individual activities
- make clear to the children the purpose and relevance of any mathematical activity
- keep records of the children's progress and achievements and set realistic targets for each individual
- Ensure that appropriate intervention is provided for individual/ groups of children who need further support in any area of mathematics.
- encourage independent use of a variety of apparatus and equipment
- use maths in cross-curricular topics wherever appropriate
- value the contributions made to mathematics by all cultures, both nowadays and in the past
- help children reflect on each new experience
- stress the importance of, and encourage the use of, mental calculation as a first resort to any problem
- ensure children meet the same mathematical ideas in a wide variety of contexts
- rehearse skills and strategies daily

### **Pupils with special educational needs and learning passports**

Teachers will aim to include all pupils fully in their daily mathematics lessons. All children benefit from the emphasis on oral and mental work and participating in watching and listening to other children demonstrating and explaining their methods. However, a pupil whose difficulties are severe or complex may need to be supported with an individualised programme in the main part of the lesson. This should be clearly shown in the targets on a particular child's learning passport.

### **Organisation of Lessons**

Organisation of maths lessons should be flexible to best meet the learning requirements of the children. All lessons should have a learning challenge and success criteria that have been shared and agreed with the children.

The learning challenge should be the focal point of the whole lesson; continually referred to by the teacher at each stage. The success criteria are the steps needed for the children to achieve the learning challenge and they should form the 'journey' of the lesson, with each one referred to at the appropriate stage.

#### **A typical lesson structure:**

- ◆ A counting / Multiplication skill (15 minutes)  
This will involve the children learning / revisiting / applying knowledge of the multiplication table they are currently learning. The children will have frequent opportunities to embed key facts and skills they have learnt. This is being supported through the **99 club** where children are completing quick-fire multiplication and division problems.  
The idea is that with repeated practice, the scheme should result in increased speed and confidence when tackling mental maths problems without relying on written workings and methods.
- ◆ Review (about 5 minutes)  
This will involve a revisit and review of the previous lessons learning, providing the children with the opportunity to embed any key skills or concepts that they have learnt.
- ◆ The main teaching activity (about 30 to 40 minutes)  
This will include both teaching input and pupil activities and a balance between whole class, grouped, paired and individual work. It should be noted that mini- plenaries should be included at various points through this phase of the lesson, to ascertain children' progress against specific success criteria and to offer support where needed. Staggered starts are used to ensure that all pupils are accessing work appropriate to their level.
- ◆ A plenary (about 5 minutes)  
This will involve work with the whole class to address any misconceptions; identify progress; to summarise key facts and ideas and to make links to other work and to discuss next steps. It will give pupils the opportunity to report back their findings either to the whole class or to a smaller group of peers and allow them to self or peer assess their learning against the success criteria for that lesson.

## **99 Club**

The 99 Club is a mental-oral starter at Moorgate Primary Academy which aims to raise standards in maths through encouraging pupils to improve their mental calculations when attempting quick-fire multiplication and division problems.

The idea is that with repeated practice, the scheme should result in increased speed and confidence when tackling mental maths problems without relying on written workings and methods.

All pupils will begin at the 11 Club and work their way up, having up to three opportunities per week during the start of one of their maths lessons to answer all calculations at their current level unaided and within the allotted time.

If all of the calculations are answered correctly twice in a row, the child moves up to the next level!

The initial 11 Club involves eleven problems which involve doubling numbers up to ten ie.  $5+5$ ,  $8+8$ . The 22 Club then adds eleven further questions involving repeated addition for numbers from one to ten ie.  $3+3+3+3$ ,  $5+5+5+5+5$ , while the 33 Club begins to introduce times tables.

Division facts are added by the time a pupil reaches the 77 Club, and in the 88 Club and 99 Club, pupils will be tackling a range of mixed multiplication and division problems.

The full breakdown of The 99 Club levels is as follows:

11 Club - 11 questions involving doubling numbers from one to ten

22 Club - 22 questions involving repeated addition of numbers from one to ten

33 Club - 33 questions introducing the 2x, 3x, 5x and 10x tables

44 Club - 44 questions adding the 1x, 4x and 6x tables

55 Club - 55 questions adding the 7x and 8x tables

66 Club - 66 questions adding the 9x, 11x and 12x tables  
77 Club - 77 questions consisting of inverse division facts  
88 Club - 88 questions of mixed multiplication and division facts  
99 Club - 99 questions of mixed multiplication and division facts

The ultimate challenge is to complete all 99 questions of the 99 Club unaided, with no errors and within five minutes!

### **Out-of-class work and homework**

We recognise the importance of making links between home and academy and encourage parental involvement with the learning of mathematics. Homework provides opportunities for children to:

- to practise and consolidate their skills and knowledge,
- to share their mathematical work with their family
- to prepare for their future learning.

Mathematics homework will primarily be accessed through 3 websites:

- <https://play.ttrockstars.com/auth/school/student>

This supports our children with their rapid recall of their multiplication and division facts.

- <https://www.mathshed.com/en-gb>

This supports our children in their recall of facts including number bonds, addition, subtraction, multiplication and division at an age appropriate level.

- <https://www.purplemash.com/sch/moorgate-b79>

This supports our children to consolidate taught mathematical skills including recall of age appropriate facts.

### **Early Years (Reception)**

The development of mathematical thought is an important area of experience for children in the Early Years. Learning in mathematics should be primarily first-hand, experiential and active. Play and talk are essential to the learning process.

Of particular importance will be the development of skills in:

- appropriate mathematical language;
- making comparisons;
- sorting;
- understanding one to one correspondence;
- conservation of number;
- recognition of numbers;
- writing numbers correctly;
- basic ordinal language;
- early use of estimation;
- naming basic 2D and 3D shapes;
- copying and recognising patterns;
- early use of conventional time units;
- early use of non-standard and standard measures;
- use of calculator;

- reading and recognising simple graphs;
- early use of appropriate IT.

As an academy we recognise that some of our children will be ready to embark upon the National Curriculum during their time in Reception. We need to be aware of this and ensure that such children undertake work that is appropriate to their ability.

### **Years 1 - 6**

Pupils will follow the requirements of the National Curriculum and the programmes set out in the Numicon Handbooks for their appropriate year group. The sections of the programmes of study interrelate. Developing mathematical language, reasoning and skills in applying mathematics should be set in the context of the other areas of mathematics.

Special time and attention will be given to children with special needs (including children for whom English is not their first language) and particularly able children.

### **Pupil's Records of Work**

Children should always be encouraged to form numerals correctly and legibly and reversals should always be pointed out and corrected. As the children move through KS2, they will be taught to record their work in a variety of forms, including standard written algorithms.

The children will be encouraged to have good work habits, to set work out neatly and to show their method of working out (algorithm) so that the work can easily be talked through. When using squared paper, children will be expected to write one digit per square.

The date will be written digitally (24/1/2013).

Work will be marked with reference to the success criteria for that particular lesson. Marking should be helpful and not critical and crossing out should not be used. (For more details see Marking and Feedback Policy).

The children's books will demonstrate the wide variety of mathematics work undertaken throughout the year. These may contain examples of symbolic, graphical, diagrammatic, pictorial, written and group work. They may also contain a teacher's note about oral work and there may also be a note about (or photographs of) examples of construction work, mathematical models and maths games played and any assessment tests or check-ups the child may have completed.

### **Assessment and Recording**

The schools own assessment tracking grids are at the centre of teacher assessments to track children's progress and inform teacher planning. Assessments are carried termly using I-Track and are fed back to the Co-ordinator/ Senior Leadership Team. Assessment is supported by the evidence obtained from books whilst also taking into account short-term assessments which are an informal part of every lesson. These are used to check children's understanding and give teachers information, which will help them to adjust their day-to-day lesson plans and inform future planning and are closely matched to the learning challenge.

The purpose of these assessments is to monitor and review pupils' progress and attainment. These will be made through compulsory National Curriculum mathematics tests for pupils in Years 2 and 6. In addition to this, the school also uses PUMA assessments to support teacher judgements. Teachers will also use Itrack and supplementary notes and knowledge about their class to produce a termly maths level for each child. Accurate information will then be reported to parents and the child's next teacher.

### **Reporting**

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. Parents also have opportunities to discuss progress at two parents' evenings and there are regular open days where parents are invited to come into academy to observe or take part in lessons.

### **Equal Opportunities**

#### *All children and staff have equal human rights at Moorgate Primary Academy*

All pupils will have equal opportunity to reach their full potential across the mathematics curriculum regardless of their race, gender, cultural background, ability or physical disability.

### **Parental Partnership**

The whole policy will be available on request or can be assessed through the school website. Further information will be communicated through letters, the school website/ app/ social media.

### **Management, Monitoring and Evaluation**

This subject is monitored on a day-to-day basis by the Headteacher, subject leader and senior leadership team.

Monitoring will take the form of lesson observations, planning scrutinies, learning walks, pupil conferences, book trawls and staff questionnaires. This policy will be reviewed on an annual basis.

### **Staffing**

#### Area of learning Team

The subject is led by Z.Villers with support the Mathematics link governor.

### **Governors**

Governors agree and review the Policy on a regular basis. They also question the Headteacher and subject co-ordinator to ensure that the policy is implemented and impacts positively on learning and teaching. The Curriculum Committee carry out a detailed review of the Mathematics Policy on an annual basis.

### **The role of the Mathematics co-ordinator:**

- ❖ ensure understanding of the requirements of the National Curriculum for Mathematics
- ❖ keep up to date with developments in maths teaching
- ❖ teach demonstration lessons
- ❖ observe colleagues and monitor plans and quality of teaching with the Headteacher/ leadership team
- ❖ lead by example in the way of teaching in own classroom
- ❖ prepare policy documents and schemes of work as necessary
- ❖ advise colleagues, help develop expertise and monitor the teaching of maths throughout the academy
- ❖ encourage the development of valid maths activities that are appropriate, differentiated and enable progression
- ❖ encourage use of ICT as appropriate in supporting teaching/motivating pupils
- ❖ liaise with Key Stage 1 and 2 staff, Headteacher, mathematics link governor, SUAT members, parents and local authority advisers as necessary
- ❖ work co-operatively with the SENCO
- ❖ discuss regularly with the Headteacher and the mathematics governor the progress of implementing the National Curriculum in the Academy/
- ❖ use maths budget to buy appropriate resources and equipment
- ❖ collect and maintain resources and ensure accessibility
- ❖ contribute to the in-service training of staff

## **Inclusion**

The academy's equal opportunities policy applies to the teaching of mathematics as to all other subjects.

## **Environment**

It is important that the classroom environment supports both the learning and teaching of mathematics.

The academy aims to provide a mathematically stimulating environment:

- through the development and use of working walls to support learning and teaching in a lesson or series of lessons.
- through interactive displays that promote mathematical thinking and discussion
- through displays of pupils' work that celebrate achievement
- by providing a good range of resources for teacher and pupil use.
- In every classroom, resources such as number lines, hundred square, place value charts and multiplication squares should be displayed as appropriate and used for whole class or individual work.
- Use of Numicon on display to show the visual representations of number.

This Policy was reviewed: January 2020

Date of next review: January 2022