

Park Brow Community Primary School Mathematics Policy



2023-2024

PARK BROW MATHEMATICS POLICY

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.

National Curriculum (2014)

Aims and Objectives

Mathematics teaches us how to make sense of the world around us through developing a child's ability to calculate, to reason and solve problems. It enables children to understand and appreciate relationships in pattern in both number and space in their everyday lives. As children progress through Park Brow they learn to appreciate the contribution made by many people to the development and application of mathematics.

At Park Brow our mathematical aims are built upon the principles of the National Curriculum. Our aims are:

- To promote enjoyment and enthusiasm for learning through practical activity, exploration and discussion.
- To promote confidence and competence with numbers and the number system
- To develop the ability to solve problems through decision making and reasoning in a range of contexts.
- To develop a practical understanding of the ways in which information is gathered and presented.
- To explore features of shape and space, and develop measuring skills in a range of contexts.
- To understand the importance of mathematics in everyday life.
- To foster and develop mathematical resilience, perseverance and logical thinking.

Through fulfilling these aims all of our pupils:

- Become fluent in the fundamentals of mathematics.
- Develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- Are able to reason mathematically.

- Are able to follow a line of enquiry, make conjectures, generalisations and develop mathematical arguments.
- Are able to provide mathematical proof and justifications using the correct mathematical language and terminology.
- Can solve problems by applying their mathematical understanding to a variety of sophisticated problems.
- Can demonstrate resilience and the ability to solve problems and puzzles logically by breaking it down into a series of simpler steps and persevering in seeking solutions.

Teaching and Learning

At Park Brow Primary School a 'mastery' approach to mathematics has been adapted and implemented to meet the individual needs of our children. We use the Power Math's Scheme of Work to ensure that our math's is broken down into small, progressive steps that are built upon daily. We feel it is essential that our children experience math's in a variety of situations and that they understand concepts using the concrete, pictorial and abstract model.

The school uses a variety of teaching and learning styles in the delivery of Mathematics. From EYFS to Year 6 we follow the Power Math's scheme for our daily mathematics lessons. Alongside this, we consistently develop the children's arithmetic skills through our morning basic skills sessions. Our principal aim is to develop the children's knowledge, skills and understanding in mathematics whilst facilitating a rich and secure mathematical environment where children feel confident to explore mathematical concepts.

Power Math's

The philosophy behind Power Math's is that being successful in maths is not just about rote-learning procedures and methods, but is instead about problem solving, thinking and discussing. Many people feel they were taught math's in a way that was about memorising formulas and calculation methods, then having to apply them without any real understanding of what or how these methods actually work. Power Math's includes practice questions to help children develop fluent recall and develop their conceptual understanding. Power Math's uses 'Learning Power' characters to prompt, encourage and question children. They spark curiosity, engage reasoning, secure understanding and deepen learning for all.

Each lesson has a progression, with a central flow that draws the main learning into focus. There are different elements, informed by research into best practice in maths teaching, that bring the lessons to life:

- **Discover** - each lesson begins with a problem to solve, often a real-life example, sometimes a puzzle or a game. These are engaging and fun, and designed to get all children thinking.
- **Share** - the class shares their ideas and compares different ways to solve the problem, explaining their reasoning with hands-on resources and drawings to make their ideas clear. Children are able to develop their understanding of the concept with input from the teacher.
- **Think together** - the next part of the lesson is a journey through the concept, digging deeper and deeper so that each child builds on secure foundations while being challenged to apply their understanding in different ways and with increasing independence.
- **Practice** - now children practice individually or in small groups, rehearsing and developing their skills to build fluency, understanding of the concept and confidence.
- **Reflect** - finally, children are prompted to reflect on and record their learning from each session and show how they have grasped the concept explored in the lesson.

Basic Skills Sessions

The national curriculum for Mathematics states that pupils should become fluent in the fundamentals of mathematics through varied and frequent practice. Basic skills sessions happen daily in all classrooms (Year 1 - Year 6), children are provided with additional time each day to consolidate their understanding of the four operations of mathematics (addition, subtraction, multiplication and division). In Key Stage One the focus is on number bonds and memorizing number facts. In Key Stage Two the focus is on multiplication tables and related division facts.

Additional Support/Challenge

In all classes there are children of differing mathematical ability. We recognise this fact and provide suitable learning opportunities for all children by tailoring the challenge of the task, teaching approach or grouping to the ability of the child. In addition to this, support staff and additional adults take an active role in all aspects of the mathematics lesson and are integral in supporting, challenging and fostering mathematical understanding. Power Math's is based on a 'small-steps' approach, sometimes called a mastery approach. This means that the concepts are broken down so that your child can master one idea without feeling over-whelmed. There are a range of

fluency, reasoning and problem solving questions in each lesson that are designed to support the different needs and confidence levels within a class, while at the same time fostering a spirit of working and learning together. Each lesson includes a challenge question for those children who can delve deeper into a concept.

1. Early Years and Foundation Stage

We believe that the pre-national curriculum offered to children at Park Brow School should be based on the cornerstones of good practice as laid down in the Curriculum Guidance for the EYFS.

We teach mathematics in our Foundation Stage through focused adult input and in continuous provision. Mathematics is taught through the Power Math's scheme, this allows a familiar, easier transition from EYFS to Year 1. As the class is part of the Foundation Stage of the National Curriculum, the work the children complete is in line with the objectives set in the Early Learning Goals, which underpin the curriculum planning for children aged three to five.

We give all the children ample opportunity to develop their understanding of number, measurement, pattern, shape and space through varied activities that allow them to enjoy, explore, practice and talk confidently about mathematics.

By the end of Foundation Stage children should be able to count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. They should also be able to use quantities and objects to add and subtract two single-digit numbers and count on or back to find the answer. In addition children should be encouraged to solve problems, including doubling, halving and sharing.

2. Key Stage 1

In Key Stage 1 Park Brow children are provided with opportunities to develop confidence and mental fluency with whole numbers, counting and place value. This includes working with numerals, words and the four operations. During this key stage our children develop the ability to recognise, describe, draw, compare and sort different shapes using the correct mathematical vocabulary. They are also encouraged to explore a range of measures and are challenged to describe and compare different quantities such as length, mass, capacity/volume, time and money. This is all taught through the Power Maths' scheme and additional consolidation lessons.

To aid fluency as our children progress to Key Stage 2, it is expected that by the end of Key Stage 1, all of our children know the number bonds to 20, are precise in using and understanding place value and can read and spell mathematical vocabulary with increasing accuracy. Children are able to practice this daily during their basic skills sessions.

3. Lower Key Stage 2

At lower Key Stage 2 Park Brow children become increasingly fluent with the concept of place value, number facts, whole numbers and all four operations. Our children are taught to develop efficient written and mental methods and are able to perform calculations accurately with increasingly large whole numbers. Pupils are encouraged to develop their ability to solve a range of mathematical puzzles and problems in a logical and systematic manner whilst demonstrating mathematical resilience and perseverance.

At this stage our children begin to draw with increasing accuracy and continue to develop mathematical reasoning so that they can analyse shapes and their properties and can confidently describe the relationships between them. They are also taught how to use measuring instruments with accuracy and make connections between measure and number.

It is our expectation that by the end of Year 4 all Park Brow children should know their multiplication tables and related division facts up to and including the 12 multiplication. They should also be able to read and spell mathematical vocabulary correctly and confidently.

4. Upper Key Stage 2

During Upper Key Stage 2 our pupils are provided with opportunities to extend their understanding of the number system and place value to include larger integers. They are encouraged to make connections between multiplication and division with fractions, decimals, percentages and ratio. With their arithmetic understanding secure, our pupils are introduced to the language of algebra as a means for solving a variety of problems. In geometry and measures our children work to consolidate and extend the knowledge developed in number. They are challenged to classify shapes with increasingly complex geometric properties and are able to use the correct mathematical vocabulary to describe them.

Throughout this stage our children develop their ability to solve a wider range of complex problems. They are challenged to reason mathematically and are expected to use efficient written and mental methods of calculation with confidence.

By the end of Key Stage 2 we expect our pupils to be fluent in written methods for all four operations and be able to work with fractions, decimals and percentages with confidence. They should also be able to read, spell and pronounce mathematical vocabulary correctly.

Cross Curricular Opportunities

At Park Brow we believe that confidence in mathematics is a precondition of success across the national curriculum and teachers' use every relevant subject to develop pupils' mathematical fluency.

During English lessons we actively promote the spelling of key mathematical vocabulary. Once a term children in Year 1 - 6 are assessed on their ability to read, spell and pronounce mathematical terminology in line with their development. In Early Years and Foundation Stage children enjoy stories and rhyme that rely on counting and sequencing whilst older children encounter mathematical vocabulary, graphs and charts when reading non-fiction texts.

- Importance of Vocabulary

We acknowledge the importance of spoken language in pupils' development across the whole curriculum - cognitively, socially and linguistically. The quality and variety of the language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. We provide children with opportunities to share their thinking in pairs, small groups and to the whole class.

In science lessons children are challenged to use and apply their data handling skills when creating tables and graphs of scientific measurements. They are provided with opportunities to use a wide range of measuring devices in real-life contexts and whole class interpretation of data highlights the importance of clear recording of information. Children are also required to read the scales and measure with increasing accuracy.

Computing provides children with the opportunity to apply their mathematical understanding in a variety of ways. Younger children use ICT to communicate results with appropriate mathematical symbols. Older children use it to produce graphs and tables when explaining their results or when creating repeating patterns such as tessellations.

The teaching of mathematics supports the social development of our children through the way that we expect them to work with each other during lessons. It also contributes to the teaching of PSHE and citizenship. The work that children do outside their normal lessons encourages independent study and helps them to be increasingly responsible for their own learning. The planned activities that children do within the classroom encourage them to work together and respect each other's views. We present children with real life enterprise situations where they have to work within a budget and look to make a profit.

Teaching mathematics to children with special educational needs

We teach mathematics to all children, whatever their ability. It is part of the school curriculum policy to provide a broad and balanced education to all children. We provide learning opportunities that are matched to the needs of the children with learning difficulties. Work in mathematics takes into account the targets set for children in their Individual Education Plans (IEPs). Park Brow also has its own Mathematics support teacher who supports identified pupils on a weekly basis (Numicon).

Assessment and Recording

At Park Brow Assessment is regarded as an integral part of teaching and learning and is a continuous process. It is the responsibility of the class teacher to assess all pupils in their class. We strive to make our assessment purposeful, allowing us to match the correct level of work to the needs of the pupils ensuring progress.

We continually assess pupils and record their progress each term using NFER standardised testing. Assessment for learning strategies and information from summative assessments are discussed during termly pupil progress reviews allowing any vulnerable children to receive immediate support.

Marking and Feedback

The main purpose of our marking policy is to ensure that as children progress through the school they benefit from constructive guidance and next step questioning to challenge and consolidate their learning further. Each age phase has a clear marking scheme, which is shared with the children verbally each day and is displayed within classrooms.

Mathematical Resources

There are a wide range of resources to support the teaching of mathematics across the school. Each classroom has its own storage unit to house mathematical resources and equipment relevant to the age of the pupils. Mathematics Help Desks or Help Packs have been designed in each classroom to allow children to independently select resources to support or further their learning.

These help desks may include:

- Number Lines
- Counters
- Cubes
- Multiplication Squares
- Base Ten Resources
- Coins

Calculators are not used as a substitute for good written and mental arithmetic. They are only 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.

Park Brow has an electronic Shared Drive that enables staff to share electronic resources and theory relating to Mathematics. A range of software is also available for children to access using school laptops and iPads.

Working in partnership with parents/carers

1. Home Learning

Should the country go into a national lockdown and school is closed or a class bubble is sent home. The delivery of mathematics will continue through Seesaw remotely and children will be provided with work to complete at home. The work set for all children will follow the Power Math's scheme and will continue from where the children left off in their classrooms. Every child has been provided with a log in to the Pupil World Power Math's Hub, they will be able to access any work their teacher allocates them through this online resource. Class teachers will continue to follow the Power Math's planning and will allocate their classes activities based on what they would have been doing in class. Staff will ensure children have access to teaching videos that explain various methods using the Power Math's and White Rose Math's home learning hubs. Staff will ensure consistency in the delivery of remote learning and will differentiate learning for those children with EHCP plans ensuring they are provided with support and appropriate challenge. Staff will ensure the children have opportunities to take

part in practical, active mathematics lessons whilst at home by providing clear expectations, instructions and examples.

2. Supporting Mathematical Learning at Home

The understanding of arithmetic concepts is greatly helped if there is a strong link between home and school. All children have access to Times Table Rock Stars and are encouraged to use the resource at least 5 times per week to develop their recall of multiplication and division facts.

Class teachers will discuss mathematical progress with parents at Review Days and via Seesaw. Parents receive updated copies of their children's progress three times during the year.

Monitoring and Review

Monitoring of the standards of children's work and the quality of teaching in mathematics is the responsibility of the Mathematics Coordinator and Senior Leadership Team.

The work of the mathematics coordinator also involves supporting colleagues in the teaching of mathematics, being informed about current developments in the subject, and providing a strategic lead and direction for the subject in the school.

The mathematics coordinator provides the head teacher with an action plan which is updated termly. A named member of the schools governing body is briefed to oversee the teaching of Mathematics. This governor meets with the coordinator to review progress. Our Mathematics School Governor is Mrs E Gaskin.

**Policy reviewed and amended by P Holden.
10th October 2023**

To be reviewed September 2024.