

Be happy Be successful Be proud Be Bankfields

# Bankfields Primary School

# Mathematics Policy

Updated September 2023 Review September 2025

# Mathematics – A Whole School Policy

#### What is Mathematics?

Mathematics is the development of logical thinking and the ability to make sense of the world. From the earliest stage, children should be provided with a variety of experiences through which they can develop Mathematical skills and concepts. It is a tool for everyday life, and a means of communicating information and solving problems. It is recognised that Mathematics is also studied for its own intrinsic qualities, including creativity – and intellectual challenge and excitement.

The National Curriculum 2013 stated:

'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.'

# **Mathematics Statement of Intent**

At Bankfields Primary School, we want our children to study mathematics with confidence and a sense of achievement. Through our teaching of mathematics, we will develop a range of skills in number, measures, geometry and statistics that will give our children the core skills and knowledge they need for life, as well as an ability to reason and think logically. We will provide opportunities for our children to apply these skills in a variety of ways through independent work, collaboration and discussion. We will support all of our pupils in becoming fluent in the fundamentals of mathematics 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.

Our lessons are designed to promote enjoyment of mathematics whilst encouraging our children to be curious, to make conjectures and generalisations based on what they notice and to be able to investigate and prove them. To enable them to do this, we will ensure that all of our children have a clear understanding of mathematical vocabulary which will enable the children to think clearly, logically and confidently as well as being able to communicate their ideas fluently.

At Bankfields Primary School, we will strive to remove any barriers to learning that children may have in mathematics, so that all of our pupils can achieve success and develop a love of the subject through quality first teaching from teachers who are passionate about the subject.

# Aims

#### Our aims in the teaching of Mathematics are that all children will:

- Enjoy the subject, and study it with confidence and a sense of achievement.
- Work hard to achieve their full potential in maths and a range of other mathematical skills including measure, shape, space and data handling.
- Use and apply these skills with confidence and understanding in practical tasks and in solving real life problems.
- Develop the correct Mathematical vocabulary as a tool, to enable them to think clearly, logically and confidently and to be able to communicate their ideas fluently and with assurance.
- Assess their own progress and understanding.
- Develop motivation, perseverance and flexibility to carry a task through to completion and also develop the ability to work in a pair or team so that they become numerate thinkers through child-led learning tasks.
- Become **fluent** (achieve mastery) 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 and work towards a **greater depth** of understanding in maths.
- Be able to **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.

# **Teaching Timetable**

Mathematics is a core subject in the 2014 National Curriculum. The National Curriculum sets out the statutory obligations for the teaching of Mathematics.

All pupils in Key Stages 1 and 2 receive a daily Maths lesson, lasting approximately 1 hour to 1 hour 15 minutes in Upper Key Stage 2.

All pupils enter the lesson and complete daily number challenges which revise key areas of mathematics and improve fluency, followed by the main teaching activity (Daily 3 in KS1 and Daily 5 in KS2). Finally, the lessons conclude with a reflection on learning which allows the teacher the final opportunity to assess the pupils' understanding, extend their learning and of the children to make a self-assessment of their progress.

At the beginning of our maths lessons, children recall their 'Maths Dictionary' which revises key vocabulary and mathematical facts that are essential for the children to understand and remember. Children also complete part of their Schofield and Sims Mental Arithmetic tests every day. This is supported by the use of Times Tables Rock Stars practice to improve the children's rapid recall of times tables.

This is the usual format of each lesson, however, class teachers may decide to organise a lesson in a different way according to the needs of the pupils. For example, some children

may be out of the room working with a Teaching Assistant during the first part of the lesson to reinforce their understanding of a concept taught the day before, which would then allow them to return to the main lesson and secure progress. Some pupils may be out of class working with their teacher or a Teaching Assistant with minimal whole-class input as prelearning activities may indicate that they need immediate challenge rather than further practice and consolidation.

#### **Teaching and Learning**

#### Early Years Foundation Stage

Early years learning concentrates on 7 areas split between prime and specific areas of learning. Mathematics is one of the specific areas.

**Numbers**: children count reliably with numbers from 1 to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.

To support this, teachers across EYFS and KS1 have added a mastering number session to their lesson which aims to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2. The aim over time is that children will leave KS1 with fluency in calculation and a confidence and flexibility with number.

**Shape, space and measures**: children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.

#### Key Stage 1

The principal focus of mathematics teaching in Key Stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects such as cubes, Numicon and place value resources and measuring tools].

To support this, teachers across EYFS and KS1 have added a mastering number session to their lesson which aims to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2. The aim over time is that children will leave KS1 with fluency in calculation and a confidence and flexibility with number.

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a

range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.

Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1. (National Curriculum 2014)

#### Lower Key Stage 2

The principal focus of mathematics teaching in lower Key Stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of Year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work. This is assessed through the Multiplication Tables Check at the end of Year 4.

Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

#### Upper Key Stage 2

The principal focus of mathematics teaching in upper Key Stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

By the end of Year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Pupils should read, spell, pronounce and apply mathematical vocabulary correctly.

# **Mastery and Greater Depth**

At Bankfields, we view 'mastery' as being the level which all children need to achieve to be at the expected standard within their year group. 'Greater depth' is when a child is able to take the knowledge and skills that they have mastered and apply them to a range of contexts and in a variety of ways. It also exposes children to a range of questions where they have to reason in detail about mathematical concepts. We obtain our 'Greater Depth' activities from a range of areas including Testbase, Focus Education Resources, NCETM Mastery Document and White Rose Maths alongside the Power Maths Resources from Pearson Education.

# Maths Mastery Approach

As a school, we have adopted a mastery approach to our teaching through our work with the North East Maths Hub from 2019 - 2023 and a Maths Mastery Specialist. This programme enabled us to develop, embed and sustain our whole-school mastery approach and ensure that our staff have the skills and knowledge needed to embed the strategies from this approach in their teaching. This has been supported with a range of CPD opportunities for both teachers and teaching assistants.

# What is a Maths Mastery Approach?

'Teaching maths for mastery involves employing approaches that help pupils to develop a deep and secure knowledge and understanding of mathematics at each stage of their learning, so that by the end of every school year or Key Stage, pupils will have acquired mastery of the mathematical facts and concepts they've been exposed to, equipping them to move on confidently and securely to more advanced material.'

# **Mental Mathematics**

At Bankfields we use the mental maths programme published by Schofield & Simms, as mental maths is an essential prerequisite to successful achievements in Mathematics. These exercises are given at appropriate levels of age and ability in numeration, in manipulation of numbers and coins, and in simple problem solving involving measure and money. The correct interpretation of the signs and associated language and process is developed. Each book is compiled on a similar plan and contains 36 weekly tests and 4 checking up tests in number, money, measure and shape. The weekly tests are presented in 3 parts A, B, C. Children spend approximately 15 minutes a day completing the test, the tests are then marked by the class teacher or with the children as a class where teaching points can be made.

A **jottings sheet or book** is used so that the children can show the different strategies they have used to solve some or all of the questions. If children are seen to be doing very well, then they can be moved onto the next book and slotted in at the appropriate test, and vice versa.

The teaching of mental maths methods is supported by the *Rising Stars Mental Arithmetic Practice Tests* for years 3-6 and Twinkl Arithmetic Practice Papers which are photocopiable tests that reflect the end of KS2 Arithmetic paper. These tests are used on a weekly basis throughout KS2 to support children with their mental arithmetic skills and pace of working.

All children from Y1 - Y6 also access TT Rockstars; a programme designed to develop rapid recall of times tables in a fun and interactive way. This can be used both in school and at home.

#### **Planning for Mathematics**

#### Long Term

Planning for the teaching of Mathematics is provided by the National Curriculum 2014 for each year group. Foundation stage planning is based on the EYFS Framework. As a school, we have created a Long Term Planning document which sets down the term in which we will teach each of the objectives in the National Curriculum. This has been carefully planned so that we can ensure there is a clear progression of skills each term as well as a balance between number and other aspects of maths.

#### **Key Concepts Progression Document**

This document sits alongside the LTP and shows the progression of skills in each mathematical concept across each year group. For example, we can clearly see from this document how learning in fractions develops in each year group, building on the skills and knowledge acquired in the previous year. This ensures that teachers fully understand the knowledge and skills that came before their current objective and where it will go next.

The Bankfields Progression in the Four Rules of Calculation document and the scheme of work for the 'other aspects of maths' sets out the progression of skills in maths from the Foundation Stage to Year 6.

#### **Short Term Planning**

This daily planning states clearly **how** the objectives from the different areas of the maths curriculum are to be delivered and is supported by the use of Smart Notebook documents which are amended daily to meet the needs of each class. Planning shows clear differentiation and progression across the school. As far as possible, teachers will use the age-appropriate objectives for their specific year group, but will back track to suit the needs of individual children and address gaps in their learning. For example, if a Year 5 child has many gaps in their learning, the teacher will refer back to the Year 3 or 4 objectives to secure their knowledge and understanding before quickly progressing onto the Year 5 work.

Planning is usually revised on a daily basis to address any misconceptions that may have arisen during the lesson and future lessons are adapted in response to daily teaching and the children's emerging needs.

Children may be taught in set ability or year groups throughout the school as appropriate.

#### **Small Steps Document**

Short term planning is informed by our 'Small Steps Document' which shows all of the key skills that the children need to be secure with in order to achieve an objective and the steps that the teacher will need to go through to secure that objective. This is particularly helpful for newer members of staff who may not have taught that particular year group previously.

# Pre-learning/post-learning and pre-teaching

Prior to teaching any new objectives, pupils complete a 'Pre-Learning Grid' to establish what they already know about that topic. This is then used to inform the teacher's planning, including pre-teaching sessions.

Pre-teaching sessions are designed to teach the basic skills required for the children to access future lessons; build their confidence and enable them to access the age-appropriate content of the lessons. In addition to pre-teaching, there may also be children who are particularly secure in a certain aspect of maths. In this case, it is essential that they are challenged from the first lesson so that they can continue to make effective and sustained progress. This could take many forms: they may be sent to work with a Teaching Assistant without having to listen to a teacher input to begin a greater depth challenge. They may work independently on an investigation then feed back to the rest of the group as the 'resident expert', or they may work with a teacher on different reasoning tasks to really challenge their thinking around a concept whilst the other pupils in the class work on practice consolidation activities.

After a sequence of lessons has been completed, the teacher will then direct the children to go back and complete the 'Post-Learning Grid', which will show which skills the children have acquired and how much progress they have made in that particular area.

#### **Cross Curricular Opportunities**

Links are made between Mathematics and other subjects where appropriate in order to deepen children's understanding and reinforce areas of weakness. These opportunities allow pupils to apply their mathematical knowledge and understanding in a variety of contexts. For example statistics and measures work in Science. These links will be indicated on short term lesson plans.

#### Links with computing

At Bankfields computing is considered to be an important tool for teaching and learning. Staff at the school use a wide range of software and resources, including iPads, to teach maths through computing in order to enhance their teaching. This includes the use of various online resources such as Espresso, TT Rockstars, RM Easimaths, Purple Mash and Testbase. The online resources that the staff use are exciting and motivating for children of all ages, and the importance of this is recognised by all staff. Interactive whiteboards and large screen computers are an integral part of maths teaching. Children in Key Stage 2 have access to the RM Easimaths programme online to reinforce their knowledge and understanding of the concepts that have been taught and also to 'plug gaps' in their knowledge.

#### Assessment and Record keeping

Assessment is used by teachers to guide the progress of individual pupils, and to inform target setting. At Bankfields, we have developed our own robust and effective assessment system which enables staff to closely monitor and track the progress that their pupils are making. Each teacher has one booklet for their maths group. Each day, they note down any children who did not achieve a specific objective and require additional support and

consolidation. This is an effective assessment for learning tool which allows us to effectively target those children who need additional support and modify our planning accordingly.

Each term, teachers give their children a 'grade' which is either:

- - minus (a pupil who has achieved up to 35 41% of the statements for their year group);
- = equals (a pupil who has achieved 41% to 59% of the statements for their year group;
- + plus (a pupil who has achieved over 60% to 84%% of the statements for their year group).
- Mastery (a pupil who has achieved over 85% of the statements for their year group).

As the focus is on breadth of study in the 2014 National Curriculum, teachers will be ensuring that all pupils have the opportunity to use, apply and firmly embed their mathematical knowledge in a variety of contexts. This allows many pupils to demonstrate a greater depth of understanding of many mathematical concepts.

For the least able pupils, if they are unable to access their age appropriate curriculum, class teachers will take a step back to the previous year group or further if required in order to 'plug gaps' in the children's knowledge and understanding before progressing. This provision for both the most and least able pupils will also be supported by additional intervention as and when required.

In addition to daily formative assessments, at Bankfields all teachers use other resources such as 'Testbase' to create their own mini-assessments which we call 'Application of Skills Tests' and these are given to test the children's knowledge on a specific area of maths at least 2 weeks after it has been taught. Furthermore, we also utilise the *Rising Stars Assessments* and previous SATs papers for Year 6 children on a termly basis. These assessments supplement our judgements of our pupils' progress by providing additional evidence of children's ability to independently apply their knowledge in each area of maths. All of these resources allow teachers to closely monitor the progress of their pupils and identify when additional intervention is required.

All assessment data is recorded in SIMs on a termly basis and this allows staff to see clearly whether pupils are making the expected progress and also shows trends in year groups. It also allows teachers to specifically analyse the effectiveness of interventions as well as the progress of groups of children such as Pupil Premium, SEND and Gifted and Talented pupils. Analysis of this data is undertaken regularly in order to constantly review and improve our teaching of mathematics throughout the school. This analysis informs short term planning and support but also the annual School Improvement Plan and any relevant INSET.

Regular use of these assessments strategies with every class in the school will enable;

- Monitoring of individuals children's progress
- Diagnosis of each child's strengths, weaknesses, errors and misconceptions.
- Tracking of progress of each child as they move through the school
- Comparisons of a year group's performance relative to previous groups in that year
- Evaluation of short- term plans and their implementation through teaching
- Checking of changing standards in performance of the whole school
- Recording and reporting on, each child's performance and progress.

In Foundation 1 (Nursery) children are assessed against the Foundation Stage Profile on entry and again as they leave Nursery. On entry to Foundation 2 (Reception), a baseline is recorded and then children are assessed against the Early Learning goals at the age of 5 at the end of the Foundation Stage.

Throughout the Foundation Stage evidence of learning and development is collected through observational assessment and monitoring and recorded in an Individuals Learning Journey

and work book.

At the end of Year 2 and Year 6, children complete the statutory assessments.

# Equal opportunities/inclusion.

(Reference should also be made to the whole school Inclusion policy.)

No child should be excluded or disadvantaged because of ethnicity, culture or religion, home language, family background, special educational needs, gender or ability. Every opportunity should be taken to engage the interest of the child by use of practical and achievable activities as well as interactive techniques to reduce barriers to learning.

Teachers employ a variety of strategies in order to teach different mathematical skills and to encourage confidence and enthusiasm. These strategies will involve Visual, Auditory and Kinaesthetic activities so that they meet the learning needs of abilities of children.

The following is a list of some suggestions:

- Direct teaching by demonstrating, explaining, discussing and summarising.
- Use of the CPA (Concrete Pictorial Abstract) approach to develop mastery of understanding.
- Full class or group interaction to give children the opportunity to explain, write on the board, offer alternative methods etc.
- Use of response partners to discuss methods and strategies.
- Use different types of questioning, including those that need rapid response and higher-level questions which require the children to use and apply their knowledge.
- Check mathematical vocabulary and notation, and make sure children understand how to interpret questions.
- Teach strategies for problem solving following the problem solving steps, using effective number sentences and calculation strategies.
- Teach test techniques using examples from Test Base and previous year's SATs papers to practise timings and develop pace.
- Use errors from all work to identify misconceptions and thus plan new objectives and any additional intervention that is required.
- Give children the opportunity to work in pairs or small groups, discussing and explaining their own ideas and methods.
- Provide child-led learning opportunities which allow the children to develop resilience and determination as well as a deepening understanding of mathematical concepts.
- Share objectives with the children and use Success Criteria to break down the objective into simple steps and allow children to review their learning.

• Use practical, hands-on experiences wherever possible – counters, number squares, solid shapes etc., as well as appropriate computer software to reinforce the objective.

#### SEND pupils

(Reference should be made to the school policy on Special Educational Needs.) When a child has been identified as having SEND in mathematics, progress is monitored by the SEND Co-ordinator. The SENDco identifies additional resources that are appropriate to support pupils and has an overview of the provision that is provided

For pupils who are working have specific barriers to learning in mathematics, additional intervention and support is provided to ensure that the pupils achieve success and reach their potential. Across the school, Teaching Assistants are used to provide support and intervention which enables SEND pupils to access the lessons and to secure progress. Across the school additional resources, including a high level of support staff, are used to address their needs; overcome their individual barriers to learning; and to accelerate progress. As well as this, teachers ensure that SEND Support Plans are fully implemented and that all lessons are effectively differentiated.

# **Gifted and Talented Pupils**

(Reference should also be made to the whole school Gifted and Talented policy.)

Gifted and Talented pupils are identified by assessment and set targets at their own level. Progress is monitored by the Gifted and Talented Lead Teacher. The Lead Teacher identifies additional resources that are appropriate to support pupils who are gifted in mathematics and has an overview of the provision that is provided.

Pupils who are gifted in mathematics have many opportunities to succeed and reach their full potential both within and outside of school. The G & T Lead Teacher maintains records of all pupils and their progress and all the staff are aware of who is gifted in maths and some of the characteristics for identifying gifted pupils. Teaching strategies in maths allow for gifted pupils to explore open-ended investigations. Staff identify on their planning how they cater for gifted pupils and the more able through a range of strategies such as questioning, differentiated activities and using specific resources. (See Gifted and Talented policy for a range of suggestions). This differentiation is also extended to the Mental Maths Scheme, as Gifted and Talented pupils complete a more challenging series of tests that provide additional opportunities to develop reasoning. In addition, individual teachers work with Gifted and Talented pupils in Mathematics on a one to one and small group basis, to provide feedback on their work and to support any specific weaknesses that may be preventing them from making further progress. Outside of the daily maths lessons, Gifted and Talented children receive additional intervention to further their knowledge of the curriculum.

Gifted and Talented pupils also have the opportunity to participate in the annual 'World Class Maths Tests' with pupils from other schools in the area. These tests consist of a paper and computer based assessment which challenge the pupils and reward their achievements in Mathematics. In addition, Gifted and Talented Pupils participate in maths clubs offered by our local Secondary Schools which challenge our pupils as well as strengthening our transition procedures for Year 6 pupils.

# The Role of the Maths Subject Leader

The role of the Maths Subject Leader is to:

- Take the lead in policy development and schemes of work to ensure progression and continuity in Maths throughout the school.
- Support colleagues in their development of short-term plans and the implementation of assessment and record keeping.
- To support staff identifying target children and monitor these target children so that there is no slippage year on year.
- Identify why these children are not making the appropriate progress and help to develop strategies to overcome the problem.
- Monitor progress in Maths from Nursery to Y6, by analysing assessment data on a termly basis from SIMs identifying groups or individuals who may be underachieving. Following this, the Subject Leader will support teachers in identifying why these children are underachieving and develop strategies to enable them to make more progress.
- Keep up to date with developments in maths and disseminate information to colleagues as appropriate.
- Plan and deliver INSET when the need arises.
- Identify areas for development from termly and end of year assessments and contribute to the whole school improvement plan.
- Take responsibility for the purchase of resources.
- To ensure a thorough coverage of maths is delivered throughout the school through discussions with staff, observations and scrutiny of work.

# Parental and Community Involvement

All parents are given a copy of our 'Progression in the Four Rules of Number' booklet which explains and gives examples of how we teach each of the four operations in each year group. The booklet shows the progression in skills throughout the school and is a useful tool for parents to use when supporting their children with their learning at home.

# Reporting to parents

- On a termly basis through invitation to attend Open Evenings to discuss and share their child's work (2 formal and 1 informal)
- Annually through a written report
- Through an open door policy, which welcomes parents to discuss their child's progress and development informally, when the need arises.
- Shared targets.

# Reporting to governors

• The Subject Leader produces an analysis of the strengths and weaknesses in maths across the school and subsequently produces an Action Plan which is reported to governors through the School Improvement Plan.

- The Subject Leader works with the Mathematics Link Governor by meeting with them when required to discuss standards in maths, actions for improvement and also to model effective teaching and learning in maths by teaching lessons that are observed by the Link Governor.
- The Subject Leader will also provide maths training to governors as and when it is required.

# Family Learning opportunities

- Parents are encouraged to come into school to engage with their children's learning in maths through Family Learning opportunities. These opportunities help us to raise the parent's aspirations as the staff show them how they can effectively support their children in their maths learning. Furthermore, it helps to develop the children's confidence in maths as they have the chance to learn alongside their parents and feel a sense of pride in their maths achievements.
- When appropriate, at Bankfields we also utilise the support of external agencies, such as the Adult Learning Service, to provide family learning opportunities.

Revised September 2023 Mrs C Murray.

**Appendix**