Welbeck Primary School



Mathematics Subject Policy

Reviewed January 2022

Aims and objectives

Our aims in teaching mathematics are that all children will:

- Develop a lifelong enjoyment and appreciation for learning maths and study it with a sense of confidence and achievement.
- Gain a secure foundation in the key knowledge, skills and concepts of mathematics.
- Have high expectations for themselves and achieve their full potential.
- Become fluent mathematicians who can confidently reason and problem-solve.
- Use and apply skills with confidence and understanding in real life problems as well as lessons.
- Develop persistence through sustained work over a period of time.
- Develop an ability to think logically and to use mathematical language with confidence and understanding.
- Have an appreciation of mathematical pattern and relationships and make rich connections across mathematical ideas.
- Have a positive attitude towards mathematics as a creative subject and experience rich problem solving and reasoning challenges with increasing sophistication.
- Gain experience of working independently, investigating their own ideas and developing their own mental and efficient written methods.

Planning with White Rose

Key Stage 1 and 2 use the White Rose 'mastery' scheme of learning to support medium term and short-term planning. Planning is adapted to the learning needs and context of our pupils with clearly structured lessons consistently taught across the whole school. All pupils have the same opportunities to learn and the necessary support to fully grasp key mathematical concepts. When pupils are secure in their understanding of their current learning they move onto a more advanced concept. Pupils who are not yet secure receive targeted individual support and intervention through pre-teaching and additional 1:1 support.

Planning

Medium term planning is created by teachers, using the relevant White Rose Scheme of Learning for each term to support this. Planning is incorporated into school proformas and stored on 'Staff Share'. All year groups have a consistent approach and planning is sequential, with planned coverage allowing pupils to return to different mathematical topics across the year. Revisiting and interweaving different topics throughout the year deepens pupil understanding. Weekly plans are created by teachers from MTP, outlining targeted adult support, key learning objectives and outcomes, key vocabulary, activities, challenge and differentiation. Planning is flexible allowing for effective use of AfL in response to the context and attainment levels of each class and individual pupils. High expectations of progress ensure pupils are always challenged and pushed to apply their learning to a variety of contexts.

Foundation Stage

Long term planning for Foundation 1 and 2 follows the EYFS Framework 2021 for Mathematics. At the foundation stage, teaching and learning promotes social skills and develops the mathematical understanding of young children through stories, rhymes, sand, water, construction imaginative play, cooking, 2D/3D creative work using different media; and by observing numbers and patterns in the environment. Practical equipment including computing is used to support the teaching and learning of number calculation. During the reception year children will become ready for a dedicated 45-minute maths lesson. Messy Maths is a play-based approach to taking maths outdoors. The outdoor environment is used as a stimulus for mathematical investigations. A maths-rich outdoor play space is created, using natural resources that facilitate mathematical thinking and problem-solving.

Teaching and learning in KS1 and KS2:

Lesson structure and teaching methods

Every pupil from EYFS to Year 6 participates in a daily maths lesson. The same learning objectives are taught to the whole class, with appropriate differentiation and challenge for all attainment groups. Maths lessons typically follow a three-part structure: mental/oral starter, main teaching activity and plenary.

Mental starters

The mental/oral starter rehearses, revises and develops facts and skills to develop recall and knowledge of key mathematical facts involving multiplication and division and to recall them quickly and accurately. Pupils also develop their ability to apply the same skill to multiple contexts, choosing the most appropriate method. Starters will be interactive, full of pace and use a wide variety of resources (including computing) and responses.

Main learning objective and teaching methods

The main learning objective introduces new or more complex learning objectives, building on prior learning. The use of mathematical language and vocabulary is a cornerstone of Welbeck's teaching and learning. The context of our school necessitates effective and clear teaching of key mathematical vocabulary to support learning and ensure all pupils make progress. Every classroom has a maths working wall which teachers effectively use to support teaching and learning, and which display key mathematical vocabulary, learning objectives and success criteria to scaffold pupils learning. Teaching methods include high quality class teacher modelling, along with whole class/group/paired discussions. Teacher questioning and teacher talk is effectively used to facilitate opportunities for pupils to explain and articulate their mathematical reasoning and thinking.

All teaching and learning is supported by resources (manipulatives, representations) that develop deep conceptual and procedural knowledge. Using concrete materials supports students to learn new concepts, relate them to what they have previously learnt and to tackle unfamiliar problems.

All staff have very high expectations for all pupils to be efficient in using written calculation methods. This allows pupils to be confident and fluent mathematicians who enjoy problem solving and reasoning. Every lesson involves modelling of written calculations and strategies to an outstanding standard. Modelling is done in conjunction with effective teacher talk, call and response, repetition and talk partners to allows opportunities for deeper understanding and consolidation. A consistent, school wide approach to using grided whiteboards across the whole school develops a secure understanding of place value from Key Stage 1 onwards. This lays the foundation for strong number sense and a secure foundation for developing written calculation methods. All pupils complete a weekly written calculation test.

In-lesson practice and consolidation

In every lesson, pupils practice and consolidate the skills they learn. Pupils work independently or in a group with targeted support from the teacher and support staff. When a pupil is secure in their understanding, they progress onto rich reasoning and problem-solving activities and investigations which ensure they are challenged and make good progress. Pupils who are not yet secure revisit skills with targeted support and differentiation which may involve the use of manipulatives and representations to deepen understanding. When pupils have successfully achieved their learning objective and have consolidated the skill they have learned, they will apply their learning in a problem solving and reasoning context, identified under an 'apply' extension. The expectation is that all pupils have an opportunity to engage in problem solving and reasoning in most lessons.

Differentiation and Challenge

Differentiation and appropriate challenge are engrained in every part of every lesson (starter, main, plenary) to cater for the range of levels of attainment and ensure learning is accessible for all pupils, especially SEN and lower attaining pupils. It is done through the degree of adult support provided, appropriate challenge ensuring progress, using enabling and extending questions, and providing/asking for different representations using appropriate manipulatives. Differentiation is achieved by emphasising deep knowledge and challenge, and through individual support and intervention.

Plenary

Lessons conclude with a plenary which allows the teacher to summarise what the children have learnt, address misconceptions, possibly mark work with children and indicate what the next step of learning will. The plenary also offers and opportunity for the children to Peer or Self assess their work and understanding

Resources

Opportunities to learn outside the classroom, in outdoor settings and in cross-curricular contexts are planned for as much as possible to engage pupils and to provide relevant, contextualised and enjoyable learning opportunities. Computing is an integral part of mathematics teaching and learning. The use of IWBs, iPads and Maths Apps are used together with a wide range of online resources. Each classroom also has a maths area with resources available for children to access independently. An annual Maths budget enables new resources to be bought or replaced. Each year an audit of resources is conducted by the Maths Leader.

Teaching and learning is supported by a range of additional, rich learning resources:

- White Rose Primary Scheme of Learning
- NRICH investigations and problem-solving activities
- NCETM investigations and problem-solving activities
- Times Tables Rockstars
- White Rose mastery activities
- Talk it, Solve it reasoning problems
- ATM 'We can work it out!' collaborative problem-solving activities
- Enrichment Day resources on staff share

Adult support

Teaching assistants give focussed support to individuals and target groups in lessons and through pre-teaching, delivering intervention programmes, supporting differentiation, preparing and managing resources and supporting assessment.

Times Tables and Arithmetic practice

For all year groups, mental calculation and fluency is developed throughout every lesson. Pupils are taught a range of mental strategies to calculate answers as well as learning and applying mathematical facts to develop their mental maths fluency and number sense. Pupils in Key Stage 1 and 2 complete weekly times tables which also incorporate fluency questions, as well as a written calculation test linked to their current scheme of learning every Friday. Every pupil has access to Times Table Rockstars, and teachers track pupil progress on a class chart. LKS2 pupils are closely tracked in preparation for the Year 4 Multiplication Tables Check (MTC).

Marking and Targets

Layered targets are used in mathematics. They are at the front of all the children's books and displayed in the classroom, and these targets are also shared with parents through Parent's Evening and children's Reading Diaries. The targets are set and reviewed Termly and are linked to times tables and fluency. All maths work is marked, with immediate marking in lessons to ascertain instant AfL. Some work will show a next step target to help children progress with their mathematics and know what they have to do next time to improve.

From Year 1-6, teachers will use the traffic light system to mark the LO of each child's work, demonstrating whether the pupil has fully understood (green) needs more practice (orange) or needs 1:1 feedback and intervention to achieve LO (red).

In KS2, the children will use self-assessment, highlighting the colour that they believe they are - green, orange or red. In KS1 children will use a smiley face self assessment system.

Maths across the curriculum

Although the mathematics curriculum is organised as a discrete subject, there are many potential cross-curricular activities. Making links between areas of learning deepens children's understanding by providing opportunities to reinforce and enhance learning.

Learning is enhanced by:

- Further opportunities to practice taught skills through purposeful use in other curriculum areas, such as Science, Computing, Art, Design Technology, Geography, History and PE.
- Enrichment Day Maths lessons which provide contextualized opportunities for pupils to apply their learning (e.g. Titanic Cargo Challenge, BeeHive Initiative Challenge).
- Providing real experiences, context and meaning for the development of core mathematical skills (e.g., measuring of new school building area, perimeter and costing charges).
- Providing opportunities for the application of knowledge in new contexts, to involve children in higher order thinking skills, such as reasoning and problem solving.
- Providing opportunities for learners to recognise and develop key aspects of learning, e.g., looking for patterns and relationships, problem solving and reasoning.
- Use of practical activities, games and puzzles.
- Building concepts by providing children with opportunities to meet the same or related information in different ways

Monitoring and Evaluation

The purpose of monitoring and evaluating activities is to raise the overall quality of teaching and track levels of pupil attainment. The mathematics leader, senior and phase leaders will monitor the quality of teaching and learning and outcomes for learners. This will include:

- Planning scrutiny
- Book scrutiny and book looks
- Lesson observations to observe quality of teaching and learning and developmental feedback
- Moderation of standards in children's work (across phases and across schools)
- Evaluation of children's attainment against targets
- Data analysis of classes, groups and individual pupils

Assessment opportunities

Formative assessment enables the teacher to identify a child's understanding and progress, to inform their immediate teaching and to plan for their coming lessons. This can take the form of:

• Discussing mathematics in the context of a practical task

- Short tests given in oral or written form
- Weekly times table/fluency and efficient written calculation tests
- Observation
- Individual discussions with children to evaluate progress.

Summative assessments consist of

- Foundation Stage Profile
- Baseline Assessment (Foundation Teacher assessment)
- Half Termly assessments
- Key Stage One SATs (Teacher assessment)
- Optional SATs in Year 3-5
- Key Stage Two SATs

Self-assessment enables the children to assess their own learning and understanding – this may be done verbally or written (e.g. traffic light system, smiley face or a comment)

Peer-assessment enables the children to assess each others learning and understanding, either verbally or written.