Welbeck Primary School

Mathematics Subject Policy

Reviewed September 2021

Aims and objectives

Our aims in teaching mathematics are that children will:

- Enjoy the subject and study it with a sense of confidence and achievement
- Gain a secure foundation in the knowledge, skills and concepts of mathematics
- Have high expectations for themselves and achieve their full potential
- Develop fluency, reasoning and problem-solving of every student within a mastery approach to teaching maths.
- Use and apply skills with confidence and understanding in real life problems as well as within a maths lesson
- 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
- Gain experience of working independently, investigating their own ideas and developing their own mental and written methods
- Experience rich problem solving and reasoning activities and be equipped with a variety of strategies which will develop their confidence in problem solving and approaching increasingly sophisticated problems.

Planning

Long term planning for Foundation 1 and 2 follow the EYFS Framework 2021 for Mathematics.
Year 1 – 6 follow The White Rose Scheme.
Medium term planning is taken from the relevant document and incorporated into school proformas and stored on The Staff Share. This planning is adapted in the light of assessment data and priority will be given to teaching areas of needing development.
Short term planning gives details of daily lessons including objectives, learning outcomes, activities, differentiation and the key role of support staff. This will be flexible and dynamic so it can be adapted following teacher assessment.

Teaching and Learning

The use and application of mathematical principles underpins the whole of mathematical teaching and learning. Opportunities are given for pupils to apply their knowledge to a wide range of reasoning, problem solving and real-life situations. They need to be able to choose appropriate equipment and methods for the task and to communicate and justify their findings.
Children will record their work in a variety of ways appropriate to purpose.

Foundation Stage
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. We use our outdoor environment as a stimulus for mathematical investigations. We create a maths-rich outdoor play space, using natural resources that facilitate mathematical thinking and problem-solving.

Key Stage 1 and Key Stage 2
All pupils participate in a daily mathematics lesson that follows the White Rose scheme of work. This ensures sequential learning for every pupil and through its small step approach students return to topics time and time again throughout the year within the study of the same area of mathematics and in other areas. This way they will continue to deepen their understanding through revisiting and interweaving.
Maths lessons typically follow a three-part structure: mental and oral starter, main teaching activity and plenary. The mental and oral starter will rehearse, revise and develop facts and skills to develop pupil fluency at every opportunity. It will be interactive, full of pace and use a wide variety of resources and responses, including computing.
The main learning objective introduces new or more complex learning objectives ensuring progression towards mastery, is done through class teacher modelling and followed by a session where pupils work independently or in a group with teacher and support staff. When pupils have developed their fluency skills, they will 'Apply' their learning to a problem solving and reasoning situation.

Differentiation and Greater Depth
Every class has a wide range of prior attainment and students with different needs. As part of the school's mastery approach and implementation of the White Rose Scheme of Learning, the same learning objectives are taught to the whole class. This ensures sequential learning and rapid progress.
Expectations are that every pupil has the opportunity to develop their fluency, problem solving and reasoning and will make expected progress.
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.
Differentiation is through a variety of ways, including the degree of adult support provided, appropriate challenge ensuring progress, using enabling and extending questions, and providing or asking for different representations using appropriate manipulatives in line with mastery approach.
Greater Depth students progress as quickly as possible onto richer reasoning and problem-solving activities and investigations when they are identified as being fluent in calculation strategies and to ensure they are making as rapid progress as possible.

Teachers use a range of rich learning resources from The White Rose Scheme of Learning, NRICH, NCETM and a variety of other collaborative problem-solving resources (see Resources below).
Real-life learning opportunities are provided through Enrichment Day Maths challenges, 'outside the classroom' apply opportunities and School Council challenges.

Lessons conclude with a plenary which allows the teacher to summarise what the children have learnt, address any 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.
For all year groups, mental calculation and fluency is a key feature, with children being taught a range of strategies to work out answers as well as learning the quick recall of mathematical facts.

Teaching is interactive and may involve whole class and group discussion, practice to consolidate skills, problem solving and investigation, practical activities, games and puzzles.

Adult support
Teaching assistants give focussed support to individuals and target groups in lessons and through prior-teaching, deliver intervention programmes, support differentiation, prepare and manage resources and support assessment.

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. A range of software is installed on laptops to support maths teaching, floor robots are available.

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.

All maths work is marked, 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:
- Giving 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 highly contextualized opportunities for pupil's to apply their leaerning (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)
- Assisting memory through providing opportunities for children to use skills in a different context;
- 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.
- 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
- 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
- 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.

Resources

There are a number of resources available to children, including Computing games and interactive activities on the laptops. An annual Maths budget enables new resources to be bought or replaced. Each year an audit of resources is conducted by the Maths Leader.

To develop children's reasoning and problem solving and provide rich learning opportunities for greater depth students, teachers use a range of rich learning resources:

- White Rose Primary Scheme of Learning
- NRICH investigations and problem solving activities
- NCETM investigations and problem solving activities
- White Rose mastery activities
- Talk it, Solve it reasoning problems
- S.T.O.Ps reasoning and investigation problems
- ATM 'We can work it out!' collaborative problem-solving activities
- Enrichment Day resources staff share

Each classroom also has a maths area with resources available for children to access independently. Classrooms have a maths working wall to display key vocabulary, maths challenges and a range of interactive maths resources. These are updated regularly to meet children's needs and the area of maths being taught. Maths games and resources are shared with parents through the school website.