

Mathematics Policy

Aims and Objectives

- 1.1** Mathematics teaches us how to make sense of the world around us through developing a child's ability to calculate, to reason and to solve problems. It enables children to understand and appreciate relationships and patterns in both number and space in their everyday lives. Through their growing knowledge and understanding, children learn to appreciate the contribution made by many cultures to the development and application of mathematics. Mathematics is a combination of concepts, facts, properties, rules, patterns and processes.
- 1.2** At Whitehall Primary School we aim to:
- promote enjoyment and enthusiasm for learning through practical activity, exploration and discussion;
 - develop mathematical skills and knowledge and quick recall of basic facts in line with the Mathematics National Curriculum 2014;
 - promote confidence and competence with numbers and the number system;
 - develop the ability to solve problems and follow a line of enquiry through decision making, representation of ideas, reasoning and communication of results within a range of contexts;
 - develop a practical understanding of the ways in which information is gathered and presented;
 - explore features of shape and space, and develop measuring skills in a range of contexts;
 - understand the importance of mathematics in everyday life;
 - embed the School's core values of communication, ambition and resilience through the teaching and learning of mathematics.

Mathematical Curriculum Planning

- 2.1** Mathematics is a core subject in the National Curriculum. The National Curriculum (2014) for mathematics aims to ensure that all pupils:
- become **fluent** 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
 - can **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.

- 2.2** We use the Collins Busy Ants scheme of work as the basis for implementing the statutory requirements of the programme of study for mathematics. Our weekly plans list the specific learning objectives and success criteria for each lesson and give details of how the lessons are to be taught. We use a standard pro-forma for medium and short term planning. The mathematics plans are monitored regularly by the Senior Leadership Team and the Mathematics Curriculum Leader. Each class teacher is responsible for writing their weekly (short-term) plans. Teachers plan their daily lessons in the weekly plan for the topic(s) they are teaching, outlining the learning objective(s) to be covered during the lesson, how they intend to cover the learning objective(s) and the resources they will use to do so.
- 2.3** We plan our topics in mathematics so that they build upon prior learning. We ensure that there are opportunities for children of all abilities to develop their skills and knowledge of each unit and we ensure that progression is evident, so that the children are increasingly challenged as they move through the school.

The Early Years Foundation Stage (EYFS)

- 3.1** We begin teaching Mathematics in the Foundation Stage classes. We relate mathematical aspects of the children's work to the objectives set out in the Early Years Foundation Stage curriculum guidance, which underpins the curriculum planning for children aged from birth to five. We give all children ample opportunity to develop their understanding of number, measurement, pattern, shape and space through varied activities that allow them to enjoy, explore, practise and talk confidently about mathematics.
- 3.2** In Nursery, children's mathematical development is carefully planned-for, through adult-led focus activities and through opportunities for child initiated mathematical learning in all areas of provision. Planning is in place to support children's mathematical development for the mathematics provision area.
- 3.3** Throughout the EYFS, carefully planned activities, toys and games are laid out to enable children's skills and challenge their thinking, helping them to embed early concepts of number and pattern. Children are encouraged to use and develop mathematics through play in all areas of provision. The continuous provision involves a balance between adult-led activities to foster conversations, where mathematical language is modelled and opportunities to extend speech and vocabulary is provided.

Mathematical resources such as number lines and Numicon are available throughout. Concepts of shape, space, direction, size, length, capacity and mass are developed through sand, water and tactile play, outdoor provision, small world play, storytelling and nursery rhymes, for example.

- 3.4** In the EYFS, the Collins Busy Ants activities are supplemented with the (National Centre for Excellence in the Teaching of Mathematics) NCETM's Teaching for Mastery materials.

Teaching and Learning Styles

- 4.1** A variety of teaching and learning styles are used in our mathematics lessons. The principal

aim is to develop children's knowledge, skills, understanding and confidence in mathematics. We do this by ensuring lessons have a flexible approach to ensure the pitch and pace suits the children. Teachers use their own judgement in how to approach teaching a concept and will incorporate group, paired or individual work as appropriate. Wherever possible, pupils are encouraged to use and apply their learning in everyday situations.

During lessons children are encouraged to ask as well as answer mathematical questions. Careful planning of key questions helps to promote higher order thinking skills. Key questions can also be identified in our weekly lesson plans. Children have the opportunity to use a wide range of resources such as number lines, number squares, digit cards and small apparatus to support their daily work. Pupils use computing in mathematics lessons where it will enhance their learning, for example, through modelling ideas and methods. Each classroom has an interactive whiteboard to use during our daily mathematics lesson. The Collins Busy Ants scheme of work is followed throughout the school. Additional resources and materials are also used, where appropriate, to support and extend learning.

4.2 At Whitehall Primary, the non-statutory guidance for the national curriculum in England document, Mathematics Guidance: Key Stage 1 and 2, is used to support long term, medium term and short-term planning and assessment. This document is used to inform Teachers on the progression of knowledge and skills and make concepts more accessible to all pupils.

4.3 In all classes there are children of differing mathematical ability. The large majority of pupils progress through the curriculum at the same pace. Although there is no differentiation in the content taught, adaptations and differentiation are made in the way of questioning and scaffolding through individual's learning. We provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. For example, lower attainers focus on developing deep understanding and securing fluency and facts and procedures, while higher attainers are challenged through more demanding problems.

A range of strategies is deployed to achieve the learning intention, for instance, pupils may be organised to work in pairs on open-ended problems or games. In Years 4 and 5, staff may choose to teach the cohort in ability groups/sets to allow for more careful adaptation of work to take place to meet the needs of the cohort. In Year 6, pupils are taught in four groups according to their mathematical ability. Support is given to the lower ability group with extension activities being provided for the high attaining ability group.

4.4 All pupils engage in:

- The development of mental strategies
- Written methods
- Practical work
- Investigational work
- Problem-solving
- Mathematical discussion using precise mathematical language.
- Consolidation of basic skills and routines

4.5 Specific methods of teaching calculations can be seen in our Calculation Policy.

4.6 At Whitehall Primary School we recognise the importance of establishing a secure foundation in mental calculation and recall of number facts before standard written methods are introduced. Following the introduction of KS1 and 2 Arithmetic SATs, we have

introduced weekly mental maths tests which aims to increase fluency in all times tables and number bonds, through their recitation and application in a variety of formats.

- 4.7** We endeavour to set work that is challenging, motivating and encourages the pupils to talk about what they have been doing. We encourage pupils to work on the 'next steps' which teachers may set. In addition, teachers may provide additional questions, investigations and tasks that secures mastery and mastery with greater depth to challenge our more able and/or gifted mathematicians using the NCTEM Teaching for Mastery document.

Cross-Curricular Links

5.1 English

Mathematics contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. For example, we encourage children to read and interpret problems in order to identify the mathematics involved. Key questioning gives children the opportunity to explain and present their work to others during the plenary session. Through assessment questions, children also have the opportunity to apply and justify their understanding of mathematical concepts through written responses. Younger children enjoy stories and rhymes that rely on counting and sequencing. Older children encounter mathematical vocabulary, graphs and charts when using non-fiction texts.

5.2 Computing and Science

Children use and apply mathematics in a variety of ways when solving problems using ICT and when hypothesising, experimenting and evaluating Scientific concepts. Younger children use Computing and Science to communicate results with appropriate mathematical symbols. Older children use Maths in Computing and Science to produce graphs and tables when explaining their results or when creating repeating patterns, such as tessellations. When working on control, children use standard and non-standard measures for distance and angle. They use simulations to identify patterns and relationships. In Year 6, children are taught algebra and learn how to solve and express algebraic equations which is the foundations of KS3 Science.

5.3 Foundation Subjects

The School's aim is for children to understand the importance of mathematics in everyday life. This is achieved through the teaching of Foundation subjects such as: Geography, History, Art and Design, Design and Technology and Music where children can apply their mathematical knowledge and skills in workshops, activities, lessons and trips. The School's Maths Long Term Plans indicates where Mathematical links can be made to the cross-curricular areas.

5.4 Personal, Social and Health Education (PSHE)

Mathematics contributes to the teaching of PSHE as it helps children to become 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 older children with real-life situations, for example, the spending of money when out of school on educational visits/residential.

5.5 Spiritual, Moral, Social and Cultural development (SMSC)

The teaching of mathematics supports the social development of our children through the way we expect them to work with each other in lessons. We group children so that they learn to work collaboratively with one another, and we give them the chance to discuss their ideas and results.

Children with Special Educational Needs and Disabilities (SEND)

- 6.1** At Whitehall Primary School we aim to provide a broad and balanced education to all pupils. We provide learning opportunities that are matched to the needs of children with learning difficulties including children with dyslexic type difficulties. Work in mathematics takes into account the SEND targets set out for individual children in their Individual Education Plans. Effective pupil tracking enables identification of pupils who may benefit from early 'intervention' at an appropriate level, i.e. Wave 2 or Wave 3. Children who are identified as being academically 'gifted' in mathematics, and who are on the school's Gifted and Talented register, are also provided with extension activities and enrichment opportunities.

Children with English as an Additional Language (EAL)

- 7.1** Mathematics should be achievable and accessible to all. Our work in mathematics takes into account the needs of children who speak English as an Additional Language. We are aware that children may often need additional support with technical language, especially where no equivalent vocabulary exists for a particular concept. Wherever necessary, children are supported with mathematical language acquisition.

Display

- 8.1** We recognise the importance of displays in the teaching and learning of mathematics. Every class displays relevant mathematical information which is consistent throughout the school. This is appropriate to the age of the class. These may include number lines, number grids, vocabulary and other display materials that provide a visual support for the children's mental processes.

Assessment and recording

- 9.1** At Whitehall Primary School we recognise that assessment and moderation lies at the heart of promoting learning and in raising standards of attainment. We further recognise that effective assessment for learning depends on using the information gained about our pupils.
The assessment procedures within our school include:

- Progress Check Questions in the Busy Ants Scheme are included and assist teachers in checking pupils' understanding of the lesson objective(s). The Assessment Guides and Test Packs provides support to assess pupils' mastery of specific targets and the programme of study for each year group
- Making ongoing assessments and responding appropriately to pupils during 'day-to-day' teaching. These 'immediate' responses are both verbal and are occasionally recorded within pupils' books. The evaluation column in our short term planning is used to make brief notes about lessons. Written feedback in books is given in response to the success criteria of the lesson;
- Adjusting planning and teaching within units in response to pupils' performance;
- Using the 'assessment for learning' questions to check learning against objectives at the end of each unit of work. We use Pupils Maths Target record of core learning objectives as the recording format for this;
- Children are encouraged to solve reasoning and problem-solving questions. The children's written responses is evidence of their understanding of the knowledge and skills learned during and at the end of a unit;
- The written response is marked against the English Marking Code. Punctuation, spellings and grammatical sentences are checked to ensure the children are articulating their understanding using the appropriate mathematical terminology and vocabulary;
- A coloured dot ('blue' – objective met, or 'red' working towards objective) on the children's work next to the learning objective, in line with the school's marking policy, and making comments on children's work where necessary;
- Moderating children's work across the school and scrutinising children's books which takes place regularly by the Senior Leadership Team and the Mathematics Curriculum Leader;
- End of unit assessments in the form of short weekly Busy Ants tests to measure progress against the key objectives is used and shared with pupils and parents. The assessments help to inform planning for the next unit of work. These assessments also inform pupils on their progress, as they indicate their scores on Pupils Maths Target record;
- The overall scores attained from the Busy Ants weekly end of unit tests inform all stakeholders (staff, pupils, parent and governor) of whether a pupil is working below, working at or above the age-related expectations at any point throughout the academic year, thus enabling teachers to report in both the interim monitoring and annual report;
- To ensure inclusion for those pupils working below the standard, pupils undertake a range of summative mini tests that allows Teachers to assess the progress children have made. **Twinkl weekly half term arithmetic skills test is used for this;**
- For the Foundation Stage, continuous baseline assessments in mathematics, focusing very much on ongoing formative assessments using the Early Year Foundation Stage Profile;
- The National SATs for Key Stage 1 and 2, which inform the class teacher as to National Curriculum score and standard gained by the each pupil. In Key stage 1 (Year 2) the National SATs tests are administered and marked by the class teacher;
- **National Test-style Standardised Assessments (NTS) from Rising Stars** for Years 1, 3, 4 and 5 are administered at the end of each term to measure the progress children have made and identify gaps in knowledge and skills. The results are then discussed with pupils and targets are generated and reviewed every half term.
- **A Maths Termly Feedback form is used in Years 1-6, where pupils have the opportunity to reflect upon the work towards the end of half term and comment on what**

they think they have performed well with, what they think they could improve upon or what they would like to get better at. This is used to facilitate discussions with the pupils to help them move on with their learning.

- 9.2.1** We recognise the importance of responding to children's work, whether orally or in writing. We seek to encourage children by highlighting positive achievements. This could include praise for use of a viable method even if the end result were incorrect. Children are given opportunities, and actively encouraged, to explain their work to others and to display their work when it seems appropriate. They are encouraged to value and respect the work of others.
- 9.2.2** Teachers distinguish between a pupil's simple slip and an error that reflects a lack of understanding. For slips, Teachers often simply indicate where each slip occurs, and encourages pupils to correct them. If errors demonstrate a lack of understanding, the teacher may decide to take alternative courses of action. For instance, with a small number of pupils, the teacher may arrange same-day intervention while for a large number of pupils, the errors will be addressed in the next lesson.

Reporting

- 10.1** 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. At the end of KS1 and KS2, each pupil's level of achievement against national standards is included as part of their annual written report.

Resources

- 11.1** We use a variety of published materials to facilitate the teaching of mathematics but recognises the need for the teaching of maths to be 'scheme assisted not scheme driven'. There are a range of resources available to support the teaching and learning of mathematics across the school. All classes use number lines, number squares and a wide variety of appropriate small apparatus to aid the teaching and learning in mathematics. Mathematical dictionaries are also available in all classrooms, as well as calculators and a range of audio/visual aids. A wide range of software is available to support the teaching of mathematics including: Twinkl, NCTEM, Khan Academy and Maths Frame. Materials are constantly updated, as new and relevant items become available. The Mathematics Curriculum Leader orders new resources after consultation with the staff.
- 11.2** General resources are kept in a clearly labelled central resource area. Some resources used in Key Stage 1 and the Foundation Stage are kept in a separate resource area or within classrooms. The library contains a good supply of Mathematics books to support children's individual research. Whitehall Primary School uses the Collins Busy Ants scheme of work to support learning in both Key Stage 1 and Key Stage 2.

Monitoring and review

12.1 Monitoring of the standards of children's work and the quality of teaching in mathematics is the responsibility of the Senior Leadership Team and the Mathematics Curriculum Leader. The work of the Mathematics Curriculum Leader also involves supporting colleagues in the teaching of mathematics, being informed about the current developments in the subject, and providing a strategic lead and direction for the subject in the school.

The mathematics Curriculum Leader gives the Headteacher and governors an annual Data Report in which the strengths and weaknesses within the subject are evaluated and indicates area for further improvement. The Mathematics Curriculum Leader has specially allocated time for fulfilling the vital task of reviewing samples of children's work and visiting classes to observe teaching in the subject.

The policy will be reviewed bi-annually with consultations made if amendments are necessary.

Links to other policies:

- Calculation policy