

Mathematics Policy

Maths Mastery equips pupils with the uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem solving skills and the ability to think in abstract ways. Mathematics is important in everyday life. It is integral to all aspects of life and with this in mind we endeavour to ensure that children develop a positive and enthusiastic attitude towards mathematics that will stay with them. The National Curriculum order for mathematics describes in detail what pupils must learn in each year group. Combined with the Schools Calculation Policy, this policy ensures continuity and progression and high expectations for attainment in mathematics.

It is vital that a positive attitude towards mathematics is encouraged amongst all of our pupils in order to foster confidence and achievement in a skill that is essential in our society. We use the new National Curriculum for Mathematics (2014) as the basis of our mathematics programme. We are committed to ensuring that all pupils achieve mastery in the key concepts of mathematics, appropriate for their age group, in order that they make genuine progress and avoid gaps in their understanding that provide barriers to learning as they move through education. Assessment for Learning, an emphasis on investigation, problem solving and the development of mathematical thinking and a rigorous approach to the development of teacher subject knowledge are therefore essential components of the approach to this subject.

Principles

- policy and provision are evaluated and reviewed regularly
- resources of time, people and equipment are planned, budgeted for and detailed when appropriate in the Strategic Development Plan
- supported by the SLT and the Subject Leader for Mathematics, teachers engage in joint professional development through Lesson Study to optimise the quality of teaching in mathematics
- planning of mathematics ensures continuity and progression across all year groups and key stages

Aims

We aim to provide the pupils with a mathematics curriculum and high quality teaching to produce individuals who are numerate, creative, independent, inquisitive, enquiring and confident. We also aim to provide a stimulating environment and adequate resources so that pupils can develop their mathematical skills to the full.

Our pupils should:

- have a well-developed sense of the size of a number and where it fits into the number system
- know by heart number facts such as number bonds, multiplication tables, doubles and halves
- use what they know by heart to figure out numbers mentally
- calculate accurately and efficiently, both mentally and in writing and paper,
- draw on a range of calculation strategies
- recognise when it is appropriate to use a calculator and be able to do so effectively
- make sense of number problems, including non-routine/'real' problems and identify the operations needed to solve them
- explain their methods and reasoning, using correct mathematical terms

- judge whether their answers are reasonable and have strategies for checking them where necessary
- suggest suitable units for measuring and make sensible estimates of measurements
- explain and make predictions from the numbers in graphs, diagrams, charts and tables
- develop spatial awareness and an understanding of the properties of 2d and 3d shapes

Provision

Pupils are provided with a variety of opportunities to develop and extend their Mathematical skills, including:

- Group work
- Paired work
- Whole class teaching
- Individual work

Pupils engage in:

- the development of mental strategies
- written methods
- practical work
- investigational work
- problem solving
- mathematical discussion
- consolidation of basic skills and number facts
- maths games

We recognise the importance of establishing a secure foundation in mental calculation and recall of number facts before standard written methods are introduced. We use accurate mathematical vocabulary in our teaching and children are expected to use it in their verbal and written explanations. Mathematics contributes to many subjects and it is important the children are given opportunities to apply and use Mathematics in real contexts. It is important that time is found in other subjects for pupils to develop their Numeracy Skills, e.g. there should be regular, carefully planned opportunities for measuring in science and technology, for the consideration of properties of shape and geometric patterns in technology and art, and for the collection and presentation of data in history and geography. We endeavor at all times to set work that is challenging, motivating and encourages the pupils to think about how they learn and to talk about what they have been learning.

Additional enrichment opportunities are provided for pupils to further develop mathematical thinking e.g. through cooking, music, and maths investigations and games. Teachers plan problem solving and investigational activities every week to ensure that pupils develop the skills of mathematical thinking and enquiry.

To provide adequate time for developing mathematics, maths is taught daily and discretely. Maths lessons may vary in length but will usually last for about 45 minutes in Key Stage 1 and 45 - 60 minutes in Key Stage 2.

Teachers' planning and approach to teaching and learning in maths is informed by guidance in the 'Singapore Maths' Teachers' Guides for each year group, making particular use of the 'concrete → pictorial → abstract' approach to conceptual development.

A Typical Lesson

A typical lesson in Year 1 to 6 will often have the following components:

- oral and mental work across the range of mathematics. This will involve work to rehearse, sharpen and develop mental and oral skills.
- main teaching session

This will include both teaching input and pupil activities and a balance between whole class, guided grouped and independent work, (groups, pairs and individual work) effectively differentiated and offering appropriate challenge. Sometimes the focus for this session is new learning, at other times pupils may be practising, to master the application of a concept they have learned earlier. The focus of this session may vary for different children depending on their learning needs.

- plenary

This will involve work with the whole class to sort out misconceptions, identify progress, to summarise key facts and ideas and what to remember, to make links to other work and to discuss next steps.

Within lessons and over sequences of lessons teachers plan a coherent teaching and learning programme based on the model:

Revisit → Review → Teach → Practise → Apply

At times there may be opportunities to develop skills and understanding of mathematics through additional activities, some of which may take place at home.

Teachers plan learning that is differentiated to meet the needs of all pupils, whether they have a specific learning difficulty in maths or whether they are particularly able. When scrutinizing work in maths books, the SLT expect to see work from any one lesson on a similar theme, differentiated for high attaining, middle attaining and low attaining pupils – possibly with individual work for an SEN pupil at one end of the achievement spectrum, to individual work for a gifted pupil at the other.

Assessment

Formative assessment occurs on a daily basis with teachers reflecting on the work pupils have completed and adapting lessons as necessary. Within the new maths 'mastery' curriculum teachers are able to assess pupils at the end of each unit of work. This assessment is based on the teachers' effective use of questioning, clear learning objectives and use of success criteria.

In addition to the ongoing formative assessment, summative tests are used on a half-termly basis. This information is used to back up teachers' formative judgements.

Each half-term teachers update their judgements on pupil attainment against the National Curriculum objectives for maths. This is reviewed by SLT to monitor pupil progress. Teachers will also use this information to help inform their next steps in planning.

National Curriculum tests are used at the end of KS1 and 2; teachers use past and sample papers to inform their assessments as they prepare pupils for these assessments.

The school's Assessment and Marking Policies inform high quality feedback and pupils' response to it in Mathematics.

Formative Assessment We use 'Assertive Mentoring' (AM) materials to support rigorous and regular formative assessment of basic skills in numeracy. Pupils sit a weekly 'Maths Challenge', the results of which are analysed to identify key gaps in understanding which are providing a barrier to progress. Pupils are set according to National Curriculum levels for a weekly 'follow-up' lesson which is planned specifically to tackle those gaps. Teachers integrate the use of formative assessment strategies such as effective questioning, clear learning objectives, the use of success criteria and effective feedback and response in their teaching.

Summative Assessment Using AM half termly single level tests, pupils are assessed against NC levels every half term. The school's progress tracking system is updated termly. National Curriculum tests are used at the end of KS1 and 2; teachers use past and sample papers to inform their assessments as they prepare pupils for these assessments.

The school's Assessment and Marking Policies inform high quality feedback and pupils' response to it in Mathematics.

Early Years Foundation Stage (EYFS) We follow EYFS curriculum guidance for Mathematics. However, we are committed to ensuring the confident development of number sense and put emphasis on mastery of key early concepts. Pupils explore the 'story' of numbers to ten and the development of models and images for numbers as a solid foundation for further progress. Teachers use the 'Singapore Maths' concrete – pictorial – abstract approach to conceptual development.

Resources

A bank of essential mathematics resources including Numicon are kept in each classroom. Further resources relating to key whole school topics for example 'Fractions' are kept in main corridor cupboards.

Information and Communication Technology

ICT is used in various ways to support teaching and motivate children's learning. Each classroom has a PC connected to an interactive whiteboard. All teachers are provided with a laptop to support their planning and provision and are encouraged to use ICT to enhance teaching and learning in mathematics where appropriate. The school is equipped with three laptop trolleys (each with 30 laptops).

Role of the Subject Leader

- Ensures teachers understand the requirements of the National Curriculum and helps them to plan lessons. Leads by example by setting high standards in their own teaching.
- Prepares, organises and leads CPD and joint professional development.
- Works with the SENCO and Intervention Co-coordinator.
- Observes colleagues from time to time with a view to identifying the support they need.

- Attends CPD.
- Keeps parents informed about Mathematics issues
- Discusses regularly with the SLT the progress of implementing National Curriculum for Mathematics in school
- Deploys support staff, where appropriate to address mathematics related needs within the school.
- Monitors and evaluates mathematics provision in the school by conducting regular work scrutiny, learning walks and assessment data analysis.

Last reviewed: May 2017

Date of next review: May 2019