Mathematics Policy

Mathematics is essential to everyday life, critical to science, technology and engineering, and necessary in most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, and a sense of enjoyment and curiosity about the subject.

Aims:

We aim to develop lively, enquiring minds encouraging pupils to become self-motivated, confident and capable in order to solve problems that will become an integral part of their future. We look where possible to make links to other areas of the curriculum and the wider world.
The new National Curriculum 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 have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems
- **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.

To achieve these we look to;

- set children challenging and intriguing goals which stimulate their thinking and encourage them to delve further to find all possibilities and outcomes.
- Provide first class quality teaching which allows mathematics to be addressed and seen in a variety of ways with a large emphasis on models and images.
- To work alongside adults and peers to overcome barriers and tackle new challenges allowing continued progress.
- To build upon previous learning, making links whenever possible and using consistent models, images and approaches throughout the school.

School Curriculum – Programme of study

Foundation Stage

The programme of study for the Foundation stage is set out in the EYFS Framework. Mathematics involves providing children with opportunities to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shape, spaces and measures. The Foundation stage strive to use

concrete to help children's conceptual understanding including resources such as numicon and the representation of the 'Singapore Bar'.

Key Stage 1 and 2

The Programmes of study for mathematics are set out year by year for Key Stages 1 and 2 in the new National Curriculum (2014). The programmes of study are organised in a distinct sequence and structured into separate domains. Pupils should make connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study. Staff have worked together to create Long and Medium Term plans for the coverage of all domains and highlighted points where previous learning can be revisited and built upon.

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, with heavy emphasis on practical resources (e.g. deines, numicon, arrow cards, measuring tools.)

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.

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. Concrete apparatus should still support learning at this point to help provide a range of models and images for the children in all aspects of maths.

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.

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. Children should draw on the models and images they have been introduced to during Key Stage 1 and Lower Key Stage 2 to help aid and develop understanding in all areas of maths.

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 aim to read, spell and pronounce mathematical vocabulary correctly.

Cross curricular

Throughout the whole curriculum, opportunities to extend and promote Mathematics should be sought. Nevertheless the prime focus should be on ensuring *mathematical progress* delivered discretely or otherwise.

Teaching and Learning

The approach to the teaching of mathematics within the school is based on:-

- An engaging mathematics lesson every day
- A clear focus on direct, instructional teaching and interactive oral work with both the whole class and smaller ability groups which builds on previous learning and offers chance for problem solving and discussion.

The curriculum is delivered by class teachers. All work is differentiated in order to give appropriate levels of work and children are taught in ability groups or mixed ability groups dependent upon the task and need of the children or class. Teaching assistants are planned for and directed to work with children to help consolidate, develop and extend their thinking and learning. Planning is based upon the new National Curriculum (2014). Programmes of Study should inform medium term plans and subsequently weekly planning. Class teachers are responsible for the relevant provision of their own classes and individually develop weekly plans which give details of learning objectives and appropriate differentiated activities. Although a weekly overview of objectives and suggested activities are planned in advance they are adjusted on a daily basis to better suit the arising needs of a class and individual pupils, from AFL and this is evidenced in teacher's planning books. Where we feel children

have achieved age related expectations within an objective, we look to broaden and deepen their understanding through problem solving and open ended tasks. At this point we would term the child to have 'mastery' of this objective.

Calculation Policy

The calculation policy (see calculation approaches for each operation) is currently being reviewed in light of the new National Curriculum including the addition of fraction work.

Inclusion and equal opportunities

All children are provided with equal access to the mathematics curriculum. We aim to provide suitable learning opportunities regardless of gender, ethnicity or home background.

Interventions

Curriculum leaders alongside teachers and SLT will identify children who are struggling to make sufficient progress from both formative and summative assessment and interventions are then organised either by the class teacher or curriculum leader. Interventions currently being run in mathematics are:

- 1st class @ Number 2
- Springboard
- MyTy Maths
- Toe by Toe

All interventions are closely monitored and reviewed each half term for success and progress of each individual.

Assessment

Formative Assessment

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. This informs next day plans and also highlights children who may need intervention work.

Summative Assessment

Teachers use Target Tracker to track individual children's progress on objectives allowing them to pull off half termly reports of children's progress and areas where there may be gaps. Teachers now use end of unit assessments to measure children's understanding and directly correlate this on to Target Tracker, judging the child to be working within the objective or secure in the objective. This then helps monitor children's overall progress through the year and band against age related expectations. 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.

Monitoring and Evaluation

The Curriculum leader, alongside SLT, are responsible for monitoring and evaluating curriculum progress. This is done through book scrutiny, planning scrutiny, lesson observations, pupil conferencing, staff discussions and auditing of resources.