

MATHS POLICY

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'Do not worry about your problems with mathematics, I assure you mine are far greater.' Albert Einstein

The importance of mathematics

Mathematics is a tool for everyday life. It is a whole network of concepts and relationships which provide a way of viewing and making sense of the world. It is used to analyse and communicate information and ideas and to tackle a range of practical tasks and real life problems.

The School's aims

Using the Programme of Study from the National Curriculum it is our aim to:

- 1* provide a relevant, challenging and enjoyable mastery curriculum for all pupils ensuring procedural fluency and conceptual understanding at a deep level
- 2* develop a positive attitude and enthusiasm towards mathematics
- 3* develop competence and confidence in age related mathematical knowledge, concepts and skills
- 4* provide children with the opportunity to understand mathematical concepts through practical 'hands on' activities at a concrete level before they move on to the pictorial and then abstract level
- 5* develop children's ability to calculate, solve problems, to reason, to think logically, and to work systematically, efficiently and accurately within age related expectations
- 6* develop initiative and an ability to work both independently and in cooperation with others; building on other's ideas
- 7* develop an ability to communicate mathematics using both relevant vocabulary and universal symbols
- 8* develop an ability to use and apply mathematics across the curriculum and in real life
- 9* involve pupils fully in all aspects of their learning, including the recognition and assessment of their achievements
- 10* to provide equal access and opportunities for all children regardless of race, gender, class, disability or ability
- 11* to ensure that CPD is relevant, linked to Performance Management, keeps us up to date with new initiatives and above all take us to the next level

12* to involve parents in their children's learning

The Essence of Maths Teaching for Mastery

- Maths teaching for mastery rejects the idea that a large proportion of people 'just can't do maths'.
- All pupils are encouraged by the belief that by working hard at maths they can succeed.
- Pupils are taught through whole-class interactive teaching, where the focus is on **all** pupils working together on the same lesson content at the same time, as happens in Shanghai and several other regions that teach maths successfully. This ensures that all can master concepts before moving to the next part of the curriculum sequence, allowing no pupil to be left behind.
- If a pupil fails to grasp a concept or procedure, this is identified quickly and early intervention ensures the pupil is ready to move forward with the whole class in the next lesson.
- If a pupil grasps concepts or procedure quickly, this is identified and the pupil is provided with appropriate tasks that will deepen their learning and promote their procedural fluency for their age group.
- Lesson design identifies the new mathematics that is to be taught, the key points, the difficult points and a carefully sequenced journey through the learning. In a typical lesson pupils sit facing the teacher and the teacher leads back and forth interaction, including questioning, short tasks, explanation, demonstration, and discussion.
- Procedural fluency and conceptual understanding are developed in tandem because each supports the development of the other.
- It is recognised that practice is a vital part of learning, but the practice used is **intelligent practice** that both reinforces pupils' procedural fluency and develops their conceptual understanding.
- Significant time is spent developing deep knowledge of the key ideas that are needed to underpin future learning. The structure and connections within the mathematics are emphasised, so that pupils develop deep learning that can be sustained.
- Key facts such as multiplication tables and addition facts within 10 are learnt automatically and early to avoid cognitive overload in the working memory and enable pupils to focus on new concepts.

Curriculum Provision:

Foundation Stage pupils follow the Early Years Foundation Stage (EYFS) curriculum. Generally, play underpins the delivery of the EYFS curriculum. Practitioners provide

well-planned experiences that support children's mathematical development. These activities happen both indoors and out and provide opportunity to learn with enjoyment and challenge. Added to this the Maths Mastery (ARC) programme takes place each day in the reception classes.

In Key Stages One and Two, each class follows the Mathematics National Curriculum. Each class teacher is responsible for the mathematics in their class in consultation with and with guidance from the mathematics post holder and coordinator.

Each class organises a daily lesson of between 45 and 60 minutes for mathematics. All children are grouped by year for their daily mathematics lesson and individual children's needs are catered for through differentiation.

Through careful planning and preparation we aim to ensure that children are given opportunities for:

1. practical activities and mathematical games
2. problem solving - children are taught and given time to practice the skills for using and applying which involve the organisation of thinking, the selection of ideas and strategies to implement and evaluate these. These ensures procedural fluency is developed
3. developing mathematical vocabulary and language through 1:1, group and whole class discussions and activities with peers and adults.
4. open and closed tasks
5. developing a range of efficient methods of calculating e.g.: mental, informal/formal written calculations and using a calculator for the more able in upper KS2
6. working with ICT as a mathematical tool

The Maths Mastery programme (ARC) is being rolled out across the school and this initiative began in Reception and Year 1 in 2015/2016. This programme, which has been endorsed at the highest level, encapsulates both our aims and the mastery approach above. The programme will be monitored and adapted to suit our children's needs as we explore its potential. Each lesson is approximately 45 minutes with an added 15 minute Maths Meeting to reinforce and assess key concepts.

The mathematics curriculum is enriched through the delivery of fortnightly thinking lessons from the Cognitive Acceleration programmes.

Early Years, KS1 and KS2 follow Cognitive Acceleration programs: 'Let's Think' and 'Lets Think through Maths', where appropriate.

Calculation:

Details of our approach to calculation are documented fully in our calculation policy.

Planning and Organisation:

Long and medium term planning is based on the Mathematics National Curriculum and Maths Mastery (ARC).

For short term planning, all teachers use short-term weekly/fortnightly planners with common column headings. Short term planning is informed, annotated, and evaluated by individual teachers and changed according to ongoing assessments of the class and individual children.

Mathematics Homework

Homework is an extension of class work. Homework is set regularly in accordance with the time frame below.

Year Group	Frequency Per Week	Length Per Homework
EYFS	At least once a week	10 minutes
Key Stage One	At least 2	15 minutes
Year 3	At least 3	20 minutes
Year 4	At least 3	20 minutes
Years 5 and 6	At least 4	30 minutes

Assessment and Record Keeping

Formative teacher assessment and AFL is ongoing and is an integral part of planning, teaching and learning. Regular feedback to children about their progress and next steps is given to children orally and in written form as appropriate.

Formal periodic assessments are carried out in line with the school assessment timetable.

Evidence of individual assessment and record keeping can be found in:

- Children's books (Key Stage One and Two)

- Pupil peer marking matched against individual targets in exercise books.
- Evaluated weekly and medium planning sheets drawing upon information gained through observation, discussion, marking and testing.
- Pupil Review meeting minutes
- Tracking grid (Target Tracker) — 'January', 'March' and 'July' teacher assessment levels
- Rising Star end of year assessments are carried out in Yrs 3,4 & 5
- End of Key Stage SATs — Year 2 and Year 6

EYFS carry out observation records and learning journeys. These are based on individual long and short observations, photographs and work samples which are guided by Development Matters Early Learning Goals.

EYFS record assessment data each term on Target Tracker. Judgements are made and recorded based on the Good Level of Development by the end of Reception.

Assessment records are passed on to the next teacher at the end of the school year and are used to inform provision for the following academic year.

Parents are informed of pupil progress through parent-teacher consultations and a written report in the summer term.

Pupils For Whom English is an additional language

When teaching mathematics, teachers will take into account children's needs and experiences. This includes children's mathematical skills and practical knowledge from other cultures.

Displays will reflect other languages and cultures, numbers and mathematical vocabulary for example will be available in books as well as displayed in classrooms

All children including EAL and BME children need to be engaged through a visual and interactive approach with the use of appropriate and culturally relevant resources for example, multi lingual number lines, shapes, games and puzzles from other cultures.

Work planned needs to be differentiated and structured appropriately to meet the specific needs of EAL and BME and allow them to work independently of both the class teacher and other support teachers

Pupils with Special Educational Needs (SEN) including gifted mathematics

Children identified with SEN in mathematics are taught within the daily mathematics lesson. Activities are differentiated to ensure that the learning is accessible but challenging and accelerate children's learning.

Where applicable children's IEPs incorporate suitable objectives from the age related National Curriculum and teachers keep these objectives in mind when planning work.

Additional support staff are strategically placed to support groups or individual children. They work collaboratively with the class teacher planning for and assessing pupil's progress; identifying next steps. Additional sessions or intervention programmes will also be delivered to individuals or small groups where appropriate.

In addition to class and school provision, pupils identified as more able mathematicians may be selected for additional out of class enrichment programmes.

Cross Curricular Links

We believe that pupils learn best when they make connections across the curriculum; setting mathematics in real life context. Throughout the whole curriculum opportunities exist to extend and promote mathematics. Teachers seek to take advantage of all opportunities.

Extra Curricular Links

We offer a wide range of mathematical extra-curricular activities during the school year. These may include:

- After school Booster Clubs
- Off-site/out of class provision for more able mathematicians
- Maths Week
- Maths evening for children, parents and carers

- Mathematical language through song
- Mathematical language through story
- Mathematics from other cultures

Classroom Environment:

Teachers should create an inviting 'Maths Area' housing a variety of mathematical activities, suitable for all abilities.

Mathematics displays should be both informative and interactive, with clear labels and challenging questions that engage and extend children's understanding.

All classrooms should be number and mathematically rich with age and ability appropriate displays reinforcing and extending mathematical understanding, knowledge and vocabulary.

All resources should be accessible, multi-cultural and clearly labeled

Resources:

Each classroom has a set of core resources for teaching mathematics.

This includes:

- Dienes sets for KS1 and KS2
- Variety of attribute sets for sorting
- Variety of counting equipment e.g. bead strings
- Conservation sets
- 30 small whiteboards with pens for mental and oral work
- Large teaching 100 square (Key Stage One) and individual 100 squares (Key Stage One and Years 3 and 4)
- A range of number lines including large number, multi lingual numbers, negative number and empty lines for whole class and group sharing.
- Calculators (Years 5 & 6 More Able)
- Clock sets (Years 1 – 6)

- Age appropriate rulers (1 metre and 30cm)
- Protractors and compasses (Years 5 and 6)
- Shape Sets (3D and 2D) including nets
- Multi link
- Money Sets (EY, Key Stage 1 and Lower Juniors)
- Measuring equipment — containers for capacity and scales for mass
- Age and ability appropriate mathematical games, puzzles and books

There is also a central maths equipment store in each year group which houses whole class sets of the following:

- Capacity jugs
- Teaching clock and individual clocks
- Volume sets
- Scales and weights