



Mathematics Policy

Parkfield Community School

Aims

What is mathematics and why is it important?

Mathematics is the means by which we observe and make sense of our world. In this subject, students learn to explain, predict and represent events and tackle everyday problems. Mathematics is of central importance to modern society. It is key to jobs in our digital economy and critical to science, technology, finance and engineering. Mathematics is necessary for any employment or independent life and we encourage our children to recognise this.

At Parkfield we aim not only to prepare our children for the next stage of their education, but also to lay the foundations for successful lives after school. Our aim is to prepare our children for the jobs of tomorrow, which will require greater mathematical skills than in the past, including thinking mathematically in order to use technology that doesn't yet exist.

The aims of our maths teaching at Parkfield Community School are aligned with the aims of the National Curriculum: **fluency, reasoning and problem solving** – both in the mathematics lesson and across the curriculum. We recognise that pupils need to learn basic number facts and acquire **fluency in procedures**, alongside **developing conceptual understanding** if they are to be able to solve increasingly complex problems in life and later in the workplace.

At Parkfield we teach for mastery, this means that all children are taught one set of mathematical concepts and the big ideas in mathematics. Lessons are carefully crafted in order to allow all pupils to access these concepts and ideas and explore the rich connections between them. We have high expectations of our pupils and strive to make the mathematics curriculum accessible to all. Pupils will move through the programme of study at broadly the same pace. We recognise that all children need a deep understanding of the mathematics they are learning in order that future learning is built upon firm foundations. Learning from colleagues in Shanghai and Singapore, we have adopted same day 'catch up' sessions and additional practice to prevent children falling behind.

We recognise the importance of developing a '**growth mindset**'. At Parkfield we believe everyone is capable of learning mathematics, given sufficient time, good teaching, appropriate resources and effort. (*See footnote i) for the principles of a growth mindset.*) We aim to ensure all pupils leave us with sound mathematical skills, which will enable them to realise their potential wherever they live and whatever their background.

Aspects of mathematics teaching at Parkfield:

- A coherent journey through the curriculum is planned (learning in small steps daily);
- Learning is through a concrete – pictorial – abstract approach;
- Teachers carefully choose representations which expose the structure of the mathematics and plan to address difficult points in order to develop deep understanding of concepts;
- Children are taught to think mathematically and reason logically – looking for patterns and relationships;
- Communication - precise mathematical language is used in oral/written explanations;
- Adults use skilful questioning to reveal, probe and address misconceptions;
- Variation is used to explore the essential features of concepts;
- Mathematical skills are practised, applied and assessed across the curriculum;
- A mathematically rich environment supports learning;
- Fluency and flexibility are developed in every lesson (inc looking at relationships and making connections);
- Children grasping a concept rapidly will be challenged through rich and sophisticated problems;
- Skilful assessment identifies children who are struggling to grasp concepts leading to guided groups and catch up sessions with qualified teachers, and if required, structured interventions.

Planning

We believe that the key to success with all learners is quality first teaching (QFT – see footnote ii for details). This is promoted through a wide range of bespoke professional development from specialist teachers (maths specialists, teacher coach).

Objectives are taken from the relevant year band overview and medium term plans. These objectives enable progression in learning towards National Curriculum level descriptors.

Teachers crafting lessons together is an important aspect of CPD within the school (half a day per week 'PPA' time is a contribution toward this), an Assistant Head Teacher is attached to each year group to provide guidance and a team of maths specialist teachers are available for further support. Teachers regularly have opportunities to observe/team teach alongside each other and one of our maths specialist teachers. Detailed medium term plans are provided, along with textbooks based on Singapore style of maths teaching and resources from the NCETM. There is a range of resources available to support maths specific subject and pedagogical knowledge development for all staff.

Lessons are crafted collaboratively and flipcharts for the IWB are the plans. These are saved in the planning folder on the school computer system.

Lesson Structure/Role of the Teacher/Teaching Assistant

Lessons are structured around the concrete – pictorial –abstract approach, providing opportunities throughout for discussion, using mathematical vocabulary, developing mathematical thinking and using multiple representations. There should be opportunities to record independently in every lesson (in different ways).

The teaching is episodic and whole-class based with everyone covering the same content. Guided groups and keep-up/catch-up sessions are led by qualified teachers. Teaching assistants may circulate during the main part of the lesson, or take the lead on some whole class activities. There is an additional fact fluency session at least 3x a week in order to develop fluency with basic number facts.

Formative assessment takes place throughout every lesson. There will also be opportunities for peer/self assessment. (*See the assessment policy for more guidance on this.*)

The aim of our curriculum is to explore the big ideas in mathematics, encourage deeper thinking and independence as well as a secure understanding of key mathematical structures. It is not to produce a page of calculations, which is abstract to any real life situation. To support this approach **we do not erase incorrect answers or approaches** as they provide a valuable clue to the path a child is taking and is valuable assessment information.

Although maths is taught as a discrete subject, staff are encouraged to exploit any cross-curricular links and provide opportunities for children to demonstrate their mastery of concepts or skills in other subjects (eg: science, ICT, PE, topic).

It is the responsibility of teaching assistants working within any maths lesson **to ensure they have read, and if required, discussed the planning** with the class teacher and prepared any required resources. They are expected to provide feedback to the teacher on a daily basis for the children they have observed within the classroom. This feedback may be verbal or if preferred, written on their copy of the maths plan or on 'post-it' notes.

Learning in books is presented and marked in accordance with guidance in the staff handbook/assessment book 2017/8.

Classroom Environment

The classroom environment should be mathematically rich and support current learning. Maths working walls should be interactive, clearly visible and provide the children with key vocabulary, number lines and charts, 100 squares, number facts, prompts and challenges appropriate to the age/stage and linked to current learning. Learning mats, maths dictionaries, iPad apps, and a range of concrete materials should be available for every child.

Further guidance on creating mathematically rich environments and working walls is available as a leaflet for staff.

Homework

Appropriate homework activities are set for each child. These may focus on the development of fluency with basic facts, eg: number bonds or times tables, or provide additional practice of a concept learnt that week. From Y2 some homework is set via Mathletics (online resource) which children should be using at least three times a week. Teachers will also set other homework tasks, which may be games to play, facts to learn, or paper based questions to answer and return. There are additional homework activities available in the Maths Academy and on the school website. The key facts for each year group are also listed on the school website for parents to access. There are options such as maths breakfast club and maths homework clubs for children who need additional support with mathematics, or for children who have no home internet/computer access.

Family Partnerships

It is vital that parents and carers are actively involved in their children's learning. Maths Inspire Workshops take place at least twice a year for each class. During these workshops, parents have an opportunity to work with their children on fun, purposeful maths activities that can be extended into the home. Each workshop is planned and delivered by their children's teacher in collaboration with the maths leader. There is also considerable support offered to parents via the Maths Academy and the school website. In addition, we provide a range of homework clubs, maths homework help, regular maths newsletters and personal contact with the maths leader for support.

Resources

Each class/year group has a range of general mathematical equipment (eg: dictionaries, base ten, dice, tens frames, counters, counting sticks, Numicon, Cuisenaire, etc). A wide range of additional resources are available in the Maths Academy and in the maths store.

Class computers have access to maths software for the interactive whiteboards. A further range of software is used, which teachers should be familiar with. Recommended websites are listed on the school website and shared with staff via email updates. There are additional resources via the Mathletics website to support teachers during lessons via the interactive whiteboard and for homework and assessment activities.

Throughout the year additional activities are organised to raise the profile of maths within the school and children's enjoyment of this area; these may include visitors to promote maths skills and maths trails and challenges in collaboration with other schools.

Equal Opportunities

The provision of maths teaching is regardless of race or gender and should allow all children to reach their full potential.

Record Keeping/ Assessment

Maths workbooks/journals provide evidence of progress, along with teacher assessment notes. Learning should be recorded in as many ways as possible to provide the child with a range of experiences.

Assessment is an ongoing process in the classroom which forms the basis of future action. Formal and informal teacher assessments are based upon the practical, written and oral work completed by the children

Summative assessments take place at the end of each unit and twice a year as written tests. Written tests are analysed in order to support end of year assessment judgements and guide future planning.

Each child should be involved in the review of his/her progress and be able to contribute to discussions about different aspects of his/her work.

Refer to PCS assessment guidance for further information.

Special Educational Needs/Gifted and Talented

We aim to provide a rich mathematical education, which will develop the potential of all pupils. In line with NCETM guidance on the teaching of mathematics, we recognise that, '*There is no such thing as 'special needs mathematics' or 'gifted and talented mathematics'. Mathematics is mathematics and the key ideas and building blocks are important for everyone.*' However a child who is assessed to have special education needs in mathematics will have a maths target on an IEP and be placed on the school's SEN register and receive additional support.

Various enrichment activities are organised throughout the year for pupils who frequently grasp concepts rapidly in the daily mathematics lesson, these focus on deepening their understanding through rich and varied problem solving rather than acceleration. The maths leader is available for advice on the type of challenging and stimulating problems most likely to prepare these pupils for an exciting future in mathematics.

H Hackett
AHT/Maths Leader

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Footnotes:

i) Growth Mindset features:

- Everyone can learn mathematics to the highest levels
- Mistakes are valuable
- Questions are important
- Mathematics is about creativity, pattern spotting and sense making
- Communication and making connections are vital components of mathematics
- In a mathematics classroom the focus is not on performing or giving quick answers
- Depth of understanding is more important than speed

ii) QFT includes:

- Highly focused lesson design with sharp objectives
- High demands of pupil involvement and engagement with their learning
- High levels of interaction for all pupils
- Appropriate use of teacher questioning, modeling and explaining
- An expectation that pupils will accept responsibility for their own learning and work independently
- Regular use of encouragement and authentic praise to engage and motivate pupils
- An emphasis on learning through dialogue, with regular opportunities for pupils to talk both individually and in groups