

Maths policy reviewed:
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Beckers Green Primary School



Mathematics Policy 2022/23

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Introduction

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. (National Curriculum 2014)

The aims of the 2014 National Curriculum are for our pupils to:

- Become fluent in the fundamentals of mathematics through varied and frequent practice with complexity increasing over time.
- Develop conceptual understanding and ability to recall and apply knowledge rapidly and accurately.
- Reason mathematically; follow a line of enquiry, conjecture relationships and generalisations.
- Develop an argument, justification and proof by using mathematical language.
- Problem solve by applying knowledge to a variety of routine and non-routine problems. Breaking down problems into simpler steps and persevering in answering.

The National Curriculum sets out year-by-year programmes of study for key stages 1 and 2. This ensures continuity and progression in the teaching of mathematics.

The EYFS Statutory Framework 2021 states:

- Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically.
- Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers.
- By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built.
- In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures.
- It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

The purpose of mathematics in our school is to develop:

- positive attitudes towards the subject and awareness of the relevance of mathematics in the real world

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- competence and confidence in using and applying mathematical knowledge, concepts and skills
- an ability to solve problems, to reason, to think logically and to work systematically and accurately
- the ability to work both independently and in cooperation with others
- confident communication of maths where pupils ask and answer questions, openly share work and learn from mistakes
- an ability to use and apply mathematics across the curriculum and in real life
- an understanding of mathematics through a process of enquiry and investigation
- independence and a sense of choice as children decide their challenge and their level of understanding throughout each lesson
- use of metacognition to understand their levels of understanding/confidence during each lesson

We aim to provide a stimulating and exciting learning environment that takes account of different learning styles and uses appropriate resources to maximise teaching and learning. All children are provided with the opportunities to be successful in each lesson through our 'choose and challenge' approach to differentiation (warm up, ready, steady, go, turbo). All children are immersed into the different stages of a 'mastery' approach to teaching maths (fluency, reasoning and problem solving) and the 5 'big ideas of mastery' (representation and structure, mathematical thinking, fluency, variation and coherence) with an aim to reach a deeper level of understanding. Throughout each lesson, children will experience 5 stages of a maths lesson: explore, model, shared practise, independent practise and reflect and challenge.

Breadth of study

Careful planning and preparation ensures that throughout the school children engage in:

- practical activities and games using a variety of resources
- problem solving to challenge thinking
- individual, paired, group and whole class learning and discussions
- purposeful practise where time is given to apply their learning
- a range of methods of calculating e.g. mental or formal methods
- working with computers as a mathematical tool
- chance to master fluency of skills
- opportunity to reason and problem solve in an attempt to achieve a deeper level of understanding
- choosing their own learning in each Maths lesson through our choose and challenge approach (ready, steady, go, turbo)
- assess their own level of understanding throughout each lesson through metacognition
- low stakes quizzing in every year group (1-6) to address misconceptions
- explicit vocabulary taught linked to mathematical topics and encouragement to use specific mathematical
- focus on oracy in each lesson to encourage mathematical reasoning

Through our creative approach to teaching and learning we also seek to explore and utilise further opportunities to use and apply mathematics across all subject areas.

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Teachers planning and organisation

Long term planning

- We have chosen to formally adopt the WRM scheme of learning across all year groups (with the exception of EYFS who are using WRM in conjunction with NCETM mastering number scheme). We wanted a scheme which embedded in Mastery approaches, allowed for progressive building blocks of learning from one KS to another, provided consistency in language, concrete examples, pictorial references and abstract approaches, and allowed children to practice fluent skills interleaved with reasoning and problem solving in each session.
- Vitally, we also wanted to ensure that our curriculum was rich in procedural and conceptual variation, mathematical language and progressed in small steps which built on prior knowledge.
- We use a choose and challenge approach through warm up, ready, steady, go and turbo which enables children to progress through fluency, reasoning and problem solving in each lesson.
- We have adopted to take part in the 'NCETM - Mastering number' project in our EYFS setting (also KS1 as an intervention). This new initiative which has been rolled out in many schools in 2021 has the aim for the children to develop a greater understanding of number and their 'number sense'. This will then enable the children to have solid foundations of number before moving into KS1.

Medium term planning

Years 1-6 use the White Rose Maths Hub schemes of learning as their medium term planning documents. EYFS use NCETM in conjunction with White Rose maths.

These schemes provide teachers with exemplification for maths objectives and are broken down into fluency, reasoning and problem solving, key aims of the National Curriculum. They support a mastery approach to teaching and learning and have number at their heart. They ensure teachers stay in the required key stage and support the ideal of depth before breadth. They support pupils working together as a whole group and provide plenty of time to build reasoning and problem-solving elements into the curriculum.

Short term planning

The above schemes of learning support daily lesson planning. Lessons are planned using a common planning format for the school and are monitored at intervals by the mathematics subject leader and other members of the senior leadership team. All planning shows examples of children learning through the three stages of mastery: fluency, problem solving and reasoning. All planning (year 1 to 6) will include the 5 stages of a maths lesson: explore, model, shared practise, independent practise and reflect and challenge.

EYFS planning is based on the medium-term plans and delivered as appropriate to individual children with thought to where the children are now and what steps they need to take next.

All classes (years 1-6) have a daily mathematics lesson, all lasting for approximately one hour. Classes should also have 'maths meetings' at least four

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times a week (through the use of flashback 4s), lasting 10-15 minutes, where the children practice fundamental skills for maths or address any misconceptions which have occurred during that daily maths lesson – this takes place at a different time to their maths lesson each day. Each class will also take part in low stakes quizzing each week to highlight and address areas that need further development.

Teachers of the EYFS ensure the children learn through a mixture of adult led activities and child-initiated activities both inside and outside of the classroom. Mathematics is taught through an integrated approach.

Special educational needs & disabilities (SEND)

Daily mathematics lessons are inclusive to pupils with special educational needs and disabilities. Where required, children's IEP's incorporate suitable objectives from the National Curriculum for Mathematics and teachers keep these in mind when planning work. These targets may be worked upon within the lesson as well as on a 1:1 basis outside the mathematics lesson. Maths focused interventions in school help children with gaps in their learning and mathematical understanding. These are delivered by trained support staff and overseen by the SENCO and/or the class teacher. These will mainly focus on same day interventions or pre-teaching.

Within the daily mathematics lesson teachers have a responsibility to not only provide differentiated activities to support children with SEND, but also activities that provide sufficient challenge for children who are high achievers. It is the teachers' responsibility to ensure that all children are challenged at a level appropriate to their ability. The mastery approach to the teaching of Mathematics enables children to be challenged through reasoning and problem solving.

Equal Opportunities

Positive attitudes towards mathematics are encouraged, so that all children, regardless of race, gender, ability or special needs, including those for whom English is a second language, develop an enjoyment and confidence with mathematics.

The aim is to ensure that everyone makes progress, gains positively from lessons and to plan inclusive lessons. Lessons involving lots of visual, aural and kinaesthetic elements will benefit all children including those for whom English is an additional language (EAL).

Targeted questions are used in lessons to help children and planned support from Teaching Assistants and other adults is available if needed.

Lessons

In all lessons, learning objectives are clearly displayed and discussed with reference to how the children aim to achieve them.

The emphasis in lessons is to make teaching interactive and lively, to engage all children encouraging them to talk about mathematics. Lessons involve elements of:

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- Instruction – giving information and structuring it well
- Demonstrating/modeling – showing, describing and modelling mathematics using appropriate resources and visual displays
- Explaining and illustrating – giving accurate and well-paced explanations
- Questioning and discussing
- Justification
- Consolidating
- Reflecting and evaluating responses – identifying mistakes and using them as positive teaching points
- Summarising – reviewing mathematics that has been taught enabling children to focus on next steps
- Fluency
- Reasoning
- Problem solving
- Self-assessment of understanding and confidence through metacognition and the metawalk (first, before, after).

Pupils' Records of work

Children are taught a variety of methods for recording their work and are encouraged to use both formal and mental methods where appropriate. As the children progress through the school, they will start to become aware the best methods to use in certain Mathematical situations.

Marking

Marking of children's work is essential to ensure they make further progress. We encourage the use of instant marking throughout each lesson to enable children to progress. All work is marked in line with the school's marking policy and includes next steps where appropriate. Each child is to record which challenge they took part in and have it clearly visible in their work if they progressed through the challenges. Children are encouraged to self-assess their work, this does not have to be seen within their book and are given time to read teachers' comments and make corrections or improvements. Some pieces of work in mathematics can be marked by children themselves, exercises involving routine practice with support and guidance from the teacher – particularly in years 5 & 6.

Assessment

Assessment is an integral part of teaching and learning and is a continuous process. Teachers make assessments of children daily through:

- regular marking of work
- analysing errors and picking up on misconceptions
- asking questions and listening to answers
- facilitating and listening to discussions
- making observations
- encouragement of progression through the challenges in each lesson

These on-going assessments inform future planning and teaching. Lessons are adapted readily and short-term planning evaluated in light of these assessments,

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short term planning is used as a working document and therefore can be altered if needed throughout each week.

Medium term

Termly assessments are carried out across the school using the assessment materials for each year group provided by Cornerstones (curriculum maestro). These materials used alongside judgements made from class work support teachers in making a steps assessment for each child, which in line with the assessment policy they enter onto Primary Target Tracker. This is monitored regularly by the senior leadership team.

Teachers in years 1-6 track the detailed progress of children in mathematics against Target Tracker Statements (KPI statements). The statements cover the mathematics objectives for the year group. This process of careful tracking adds to helping teachers form an assessment for each child.

Pupil Progress meetings are timetabled each term for all classes. Progress of pupils is discussed and appropriate intervention considered and put in place where appropriate.

Long term

Y2 and Y6 complete the national tests (SATs) in May.

Times Table Rockstars

Times Table Rockstars is an online platform where children can practice their multiplication and division facts. As of 2019 children in year 4 are expected to sit a compulsory times table test set by the government, it is essential that children are confident with their times tables by this point. This platform encourages children to improve their knowledge and speed, they can battle against each other and earn 'coins' for their avatar. Each week, in class, the children will be tested on their times tables to ensure all children are making progress.

Role of the Maths Subject Leader

- lead in the development of maths throughout the school
- monitor the planning, teaching and learning of mathematics throughout the school
- help raise standards in maths
- provide teachers with support in the teaching of mathematics
- provide staff with CPD opportunities in relation to maths within the confines of the budget and the School Improvement Plan
- monitor and maintain high quality resources
- keep up to date with new developments in the area of mathematics