

East Boldon Junior School Mathematics Policy 2020



Introduction

This policy document outlines our school's views in relation to how Mathematics is both taught and learnt. It provides a basic framework through which all staff, teaching and non-teaching can approach Mathematics. Further information on calculation and our pedagogy is contained in our Mathematics Calculation Policy.

Intent

At East Boldon Junior School, we aim to inspire all children to reach their full academic potential. In mathematics this means ensuring a curriculum that is fully inclusive of all children which:

- Develops children's knowledge and understanding of Mathematical concepts whilst enabling them to practice and hone skills and methods;
- Enables them to think critically and communicate their understanding;
- Gives them opportunities to apply learnt mathematical skills in different contexts across the curriculum.
- Provides opportunities to develop problem solving skills useful for maths and across the curriculum.
- Develops children's fluency, reasoning and problem solving skills.

This policy is set within the context of the school's vision, aims and policy on teaching and learning. As a result of their learning in mathematics and problem solving across the curriculum children will:

- Be prepared for applying their skills effectively in everyday life situations, in their future learning and in the work place.
- Have the building blocks in place and to provide a solid foundation to lead onto secondary, further and higher education.

Through teaching with a problem solving approach, children will learn to understand, distil and clarify information; consider what they know that will help them to solve problems, realising what they need to know next; create systems and strategies, organising information in a way that helps find patterns and ultimately solutions and to communicate and present their findings effectively.

Implementation

Planning

Planning begins using year group National Curriculum objectives and the White Rose Maths Curriculum Overview to create Medium Term Plans. These plans will incorporate enrichment through other subject areas and investigations. Discussions with previous teaching staff should also inform planning to ensure continuity. Our collaborative Short Term Plans will be based on prior assessment (using both pupil observations and adapted pre-assessment questions) with carefully chosen activities which all pupils engage in, to make mathematical relationships and structures explicit and encourage discussion with a variety of representations. Activities focus on quality over quantity, focusing on key features of ideas, using variation to deepen learning rather than just practise steps.

- Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.
- Planning, where possible, should involve real life contexts for maths, where children are problem solving with a purpose in mind.
- There should be a whole class investigation planned every two weeks to practice different elements of problem solving, including: finding all possibilities, logic problems, finding rules and describing patterns, diagram/visual problems and exploring different aspects of number. During these investigations, there should be a honing in on specific problem solving skills that are transferable to other contexts.
- Class teachers should regularly plan for opportunities for children to apply their maths skills to different problems within maths lessons and across the curriculum. This will also allow children to revisit, practice and consolidate different areas of maths and apply them within different contexts.

Teaching

- Pupils should work on the same objectives and activities except in exceptional cases.
- Children should work in mixed ability groups for the most part.
- Differentiation should focus on how new concepts and techniques are presented or approached by pupils, through thoughtful questioning, sometimes the use of different apparatus, images and representations in class and/or through immediate intervention for these who need it.
- Challenges could include explaining, creating their own versions or deepening understanding through more complex rich problems.
- Discussions (whole class, peer and group) are a large part of lessons and pupils are expected to take an active role in their learning, displaying resilience and looking to challenge themselves within lessons.
- Children are expected to communicate their understanding so that it clarifies their thoughts, and justify and evaluate their own and others responses to create a climate of ownership and sense of learning as a group.
- Talk for maths mats should be used at least once per unit to encourage children to develop their reasoning skills. Mathematical vocabulary must be used by the children to prove or disprove statements and explain why.
- Feedback and formative assessment are integral to teaching and learning.
- Maths learning builds from a **concrete** understanding of concepts where children are manipulating objects. When children are able to see concepts this way, they then need to understand the same concepts represented **pictorially**. Children are then ready for **abstract** representation before being able to apply their knowledge to different situations.

- As a result, apparatus, images and representations are carefully chosen to enable concepts to be fully explored and connected. These should be used throughout the school as mental models to support and deepen understanding of new and known concepts and be readily available to pupils.
- Children's mental maths is of great importance, with number bonds, times tables facts and various strategies for calculation taught and practiced at school with support sought from parents through homework activities.
- Daily Hi Five sessions will be used to practise, introduce or consolidate fundamental skills and used to prepare for future topics, work on weak areas and return to topics already taught.
- A progression towards efficient written calculations should be developed and applied consistently in each year-group. The school Calculation Policy should be followed.
- Though the nature of lessons will be very different depending on the needs of the class, children should be: active; practicing skills they haven't yet mastered; learning something new OR learning to apply their knowledge in different contexts. They should be: 'doing' very quickly; working at a good pace and being productive; sharing their thoughts and methods and being successful.
- When teaching problem solving skills across the curriculum, time (and sometimes whole lessons) should be given to each aspect of problem solving ensuring children get thorough practice at: 'preparing for problem solving', 'thinking through problems to establish what they know and don't know so far'; actually 'doing the problem solving' effectively AND 'communicating the answer effectively'. They should evaluate the process too. Over time children will improve at each aspect.

Impact

Assessment

We see assessment as an integral part of the teaching process and endeavour to make our assessments purposeful, allowing us to match the correct level of work to the needs of the pupils, thus benefiting the pupils and ensuring progress.

- At the end of a maths unit (ie. a progress sequence of related lessons) an assessment is carried out with pupils. This gives children the opportunity to demonstrate (to themselves and their teacher) what they have learnt, and gives them a strong sense of accomplishment.
- At the end of each term, teachers should revisit and consolidate learning from the objectives previously taught. These should concentrate upon those general misconceptions identified from end of maths unit assessments.
- Assessment for learning should occur throughout the entire maths lesson, enabling teachers/teaching assistants to adapt their teaching/input to meet the children's needs. This feedback should be incisive and regular.
- On a daily basis, children should self-assess verbally against the learning objective and success criteria, giving them a sense of success. Children should have a sense of their achievements in their maths work and be able to describe what skills they have been learning that term.
- Pupil's work should be marked in line with the Marking Policy and should model how corrections should be made, giving children a chance to learn from their misconceptions or incorrect methods.
- Future lesson design should depend on class success evaluated through marking and observations made during the lesson.
- Teachers should use the Mastering Mathematics grids to support their assessments. Using the example questions for each strand, they can assess whether a child has mastered an objective.
- Assessment of pupil work and progress is ongoing by the class teacher and informs future planning. Teachers mark work in mathematics in line with the school marking policy.
- Summative assessments are made once per term in order to provide further understanding of the standard a child is working at and to inform a more rounded judgement of their abilities.
- Tracking is used in order that children who are not making good progress over time can be targeted for support in one form or another. What that support will be, and how intensive, depends upon the child's needs and it may be a simple strategy within whole class teaching that is needed. Where further support is deemed necessary, children can access interventions, explained below.

Tracking and Intervention:

- At East Boldon Juniors, we aim to provide children who are not making good progress, with extra support through interventions. Interventions in maths should be based on developing key number skills that are appropriate for the children involved (manipulatives are key in this process).
- To consolidate key mathematical concepts, some pupils on occasions may be removed from mixed ability classrooms to be taught in small intervention groups which target specific areas of difficulty.
- Rapid intervention occurs before the next mathematics lesson for any child with a misconception. This should be identified and actioned by the teacher.
- A teacher, who is a Maths specialist, is employed to work with small groups one day a week in Years 5 and 6.

- Success@Arithmetic: Number Sense supports those who have difficulty with the number system and fluency with number facts. This has been rolled out across school with Y6 in Autumn term, Y4 in Spring term and Y5 in Summer term.
- In Year 6, all children receive personalised support on one afternoon a week in smaller class sizes. The timetable is arranged in a carousel style where each group of approximately 20 children focus on a mathematical area of misconception for 40 minutes, before then moving on to a personalised English based lesson and a foundation subject.
- Intervention provided to boost children's progression in maths should be tightly planned, with success criteria set and assessments made frequently to ensure progress is being made.
- Whilst interventions could be carried out by Teaching Assistants, for example, what is being taught and how it is delivered is the class teacher's responsibility and communication is essential. Teacher meetings with TAs are planned as regularly as is possible.
- We identify from tracking any grouping issues that exist (e.g. gender based) and plan initiatives that would address these as part of teacher performance review meetings where children's performance is evaluated on an individual basis with class teachers.
- We also examine the progress of ability groups and those with English as an additional language, those entitled to the Pupil Premium and those with a Special Educational Needs. Where data indicates a whole school issue, it will form part of the School Development Plan.

Display and Resources

- In the classrooms there should be, either on display or easily accessible to children, level appropriate resources, particularly concrete and pictorial apparatus to support children to grasp concepts.
- Display should provide a visual support for the development of children's mental processes and reflect the strategies being taught within that year group.
- Mathematical vocabulary relevant to the maths block taught should be displayed so that children use this in the communication of their understanding.
- A wide range of manipulatives are located inside each classroom so that they are easily accessible by the teacher and pupils. Pupils are taught how to use the practical equipment to support and develop their mathematical understanding.
- All classrooms adhere to the school display policy.

Monitoring:

- Monitoring of children's progress begins with performance review meetings but continues with the subject leader evaluating further evidence to ensure children are making progress. This monitoring happens through half-termly examination of work in books, pupil interviews, analysis of assessment results and the assessments used, and through other means depending on what information needs to be gleaned. Termly lesson observations are conducted of all staff.
- Following monitoring activities, feedback is given to staff about how they can strengthen their practice and CPD (professional development) opportunities built in where it would be deemed valuable. These might take the shape of inputs during staff meetings or by a variety of other means.
- Where specific initiatives have been put in place through action planning for school development, these are monitored by the subject leader in order to evaluate their impact. Findings are reported to the head teacher and governors.

Parents and Homework

We recognise that parents make a significant difference to children's progress in Maths and encourage this partnership. The homework policy outlines how parents can support.

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