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Coton-in-the-Elms C of E Primary School

Mathematics Policy

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INTENT

1. Introduction

The 2014 National Curriculum for Mathematics aims to ensure that all children:

- Become fluent in the fundamentals of Mathematics
- Are able to reason mathematically
- Can solve problems by applying their Mathematics

At Coton in the Elms Primary School, we believe that these skills of logical reasoning, problem solving skills, the ability to think in abstract ways and the ability to use mathematical concepts confidently and proficiently are a uniquely powerful set of tools and for this reason we ensure that they are embedded within all of our Mathematics lessons and developed consistently throughout the school. Please note that this policy should be referred to alongside our Calculation Policy.

2. Ethos & Aims

We are committed to ensuring that children are able to recognise the importance of Mathematics in the wider world and that they are also able to use their mathematical skills and knowledge confidently in their lives in a range of different contexts both currently and in the future. We endeavour to ensure that our children develop a healthy and enthusiastic attitude towards Mathematics that will stay with them for life by: developing their confidence; unveiling their curiosity about the subject, increasing their perseverance in the light of challenges; and nurturing an appreciation of the beauty and power of Mathematics.

IMPLEMENTATION

3. How is it Taught?

All children in the school are taught within a single year group for their Mathematics lessons. Power Maths lessons are delivered four times a week and the teaching of fluency is additionally addressed through a weekly 1-hour arithmetic lesson. Furthermore, within KS2, a 25 minute times table activity is delivered, using TT Rockstars as an exciting internet based scheme for children to compete with each other and themselves.

A typical lesson using Power Maths lasts approximately 1 hour. Children begin with a short 'Power Up' activity which supports fluency in and recall of number facts. Following this, the main lesson begins with a 'Discover and Share' task in which a contextual problem is shared for the children to discuss in partners. This helps promote discussion and ensures that mathematical ideas are introduced in a logical way to support conceptual understanding. In KS1, these problems are almost always presented with objects (concrete manipulatives) for children to use. Children are also encouraged to use manipulatives in KS2. Teachers use



Careful questions to draw out children's discussions and their reasoning and the children learn from misconceptions through whole class reasoning. Following this, the children are presented

with varied similar problems which they might discuss with a partner or within a small group. At this point, scaffolding is carefully reduced to prepare children for independent practice. This is the 'Think Together' part of the lesson and the children might record some of their working out in their Mathematics books or on a mini whiteboard. The teacher uses this part of the lesson to address any initial errors and confirm the different methods and strategies that can be used. The children are then shown a 'challenge' which promotes a greater depth of thinking. The class then progress to the 'Practice' part of the lesson, which is designed to be completed independently. This practice uses conceptual and procedural variation to build fluency and develop greater understanding of underlying mathematical concepts. A challenge question and links to other areas of Mathematics, encourages children to take their understanding to a greater level of depth. The final part of the sequence is a 'Reflect' task. This is an opportunity for children to review, reason and reflect on learning altogether as a class and enables the teacher to gauge their depth of understanding.

In EYFS, Mathematics consists of:

- All children on the carpet for an introduction/recap of learning. (5mins)
- Children then split into three groups of roughly 8 children and work on a circuit. One group will be with the teacher doing input on the carpet following the Power Maths Discover and Share elements. One group will be outside with the TA doing more practical Mathematics activities. The last group will then have continuous provision set up around the class with a mixture of Mathematics based activities and non-Mathematics activities. The children will carousel so that all groups receive the same teaching and exposure to the topic that day. (40-45 mins) On days (x2) where the Power Mathematics practice book is to be completed, the TA will lead one group and the continuous provision activities might be more practical to work in order to work on gross motor skills also.
- All children will return back on the carpet for a recap and share about what they have learnt at the end of the lesson (5 mins)

The children are split into mixed ability groups in EYFS for Mathematics and within these groups the children have a Mathematics buddy. This pairing is typically made up of a higher and lower ability child working together who support each other during the Mathematics lessons. Working in smaller groups gives the teacher and TA the opportunity to make assessments throughout the adult led sessions and provide all the children with individual feedback. It is also beneficial for the children as they are able to contribute in front of a smaller group in order to build their confidence. At the end of each Mathematics lesson, the teacher and TA feedback to each other to see which children will benefit from interventions. These interventions may take place later that day during the afternoon sessions or during assembly time the following day.

During the continuous provision, the children have the opportunity to select either Mathematics or non-Mathematics based activities. In the classroom, there is a Mathematics area which the children know that they can visit at any point in the day and they will find vocabulary to help them, resources to use and step by step guidance if they are struggling with the Mathematics that day. The Mathematics activities set up around the classroom will be linked to the learning focus that day. These activities might also promote other areas of the children's Early Learning Goals such as Communication and Language or turn taking and sharing behaviour (PSED). These activities are hands on and fun, as we believe the play-based learning will help



consolidate what we have taught in adult led activities and give the children the chance to independently select their activities and take ownership of their learning.

The use of Mathematics resources is integral to the concrete – pictorial – abstract approach and thus planned into teaching and learning. The school has a wide variety of good quality equipment and resources, both tangible and ICT based, to support our learning and teaching. These resources are used by our teachers and children in a number of ways including:

- Demonstrating or modelling an idea, an operation or method of calculation. Resources for this purpose would include: a number line; place value cards; Dienes; money or coins; measuring equipment for capacity, mass and length; bead strings; the interactive whiteboards and related software; 3D shapes and/or nets; Numicon; multilink cubes; clocks; protractors; calculators; dice; number and fractions' fans; individual whiteboards and pens; and 2D shapes and pattern blocks, amongst other things
- Enabling children to use a calculation strategy or method that they couldn't do without help, by using any of the above or other resources as required
- Standard resources, such as number lines, multi-link cubes, Dienes, hundred squares and counters are located within individual classrooms. Resources within individual classes are accessible to all children who should be encouraged to be responsible for their use. Further resources (often larger items shared by the whole school) are located in the Mathematics Cupboard off the Hall.
- An interactive teaching tool for the purpose of modelling strategies is available to all teachers as part of the Power Mathematics scheme. Resources to support teachers' own professional development and understanding of new approaches as part of a mastery approach are available on the Power Maths 'activelearn' platform. As well as overviews of learning, these include short videos which demonstrate new methods to ensure accuracy.
- High quality practice books, approved by the DfE, as part of the national approach to teaching for mastery are used in each year group and a digital version of the Power Mathematics textbooks allows these to be share with the class during the main teaching. Teachers are encouraged to use the school playgrounds as an outdoor classroom when possible, for example, when teaching length, area or perimeter.

4. Planning & Progression

To ensure whole consistency and progression, the school uses the DfE approved 'Power Maths' scheme. This is fully aligned with the White Rose Mathematics Hub scheme. It is also acknowledged by the National Centre for Excellence in the Teaching of Mathematics (NCETM) and the Mathematics Hub programme that – 'The use of well-designed and tested textbooks is critical for the successful implementation of teaching for mastery. A good textbook is both an aid for the teacher in planning lessons and for the children during lessons and working on their own.'

The content and principles underpinning the 2014 Mathematics curriculum and the Mathematics curriculum at Coton in the Elms Primary School reflect those found in high-performing education systems internationally, particularly those of east and south-east Asian countries. The following principles and features characterise this approach and convey how our curriculum is implemented, although all materials we use have been fully adapted to the UK specification:



- Teachers reinforce an expectation that all children are capable of achieving high standards in Mathematics.
- The large majority of children progress through the curriculum content at the same pace. Differentiation is achieved by emphasising deep knowledge and through individual support and intervention.
- Teaching is underpinned by methodical curriculum design and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge.
- Practice and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts. This is addressed additionally within our weekly arithmetic lessons.
- Teachers use precise questioning in class to test conceptual and procedural knowledge and assess children regularly to identify those requiring intervention, so that all children keep up.
- Teachers will carefully plan for and model specific vocabulary to be used within each lesson. This will be displayed clearly on each classroom's Maths Learning Wall
- Teachers will regularly update their class' Maths Learning Wall to ensure that there is relevant key information to help children's learning such as vocabulary, modelled examples, pictorial representations, sentence stems, extra challenges.

The school has implemented a blocked curriculum approach to the teaching of Mathematics. This ensures that children are able to focus for longer on each specific area of Mathematics and develop a more secure understanding over time. This approach is also designed to enable children to progress to a greater depth of understanding. Subsequent blocks continue to consolidate previous learning so that the children continually practise key skills and are able to recognise how different aspects of Mathematics are linked. For example, when children have completed a block which has enabled them to master the multiplication of two digit numbers, a subsequent block on area and shape might provide opportunities to use this understanding when calculating the area of shapes with 2-digit length and width dimensions.

5. Support for SEND Pupils & Inclusion

Coton in the Elms School is committed to ensuring the active participation and progress of all children in their learning. All children will be given equal opportunities to achieve their best possible standard, whatever their current attainment and irrespective of gender, ethnic, social or cultural background, home language or any other aspect that could affect their participation or the progress of which they are capable.

By taking a mastery approach, differentiation occurs in the support and intervention provided to different children and not in the topics taught, particularly at earlier stages. The National Curriculum 2014 states: 'Children 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.'

There is little differentiation in the content taught but the questioning and scaffolding individual children receive in class as they work through problems will differ, with higher-attainers challenged through more demanding problems, which deepen their knowledge of the same content before acceleration onto new content. Children's difficulties and misconceptions are identified through immediate formative assessment and addressed with rapid intervention – commonly through individual or small group support by means of a post-teach or pre-teach.



Teachers are aware of the special educational needs of the children in their Mathematics class and although the expectation is that the majority of children will move through the programmes of study at broadly the same pace, the 2014 National Curriculum states: 'Decisions about when to progress should always be based on the security of children's understanding and their readiness to progress to the next stage.'

If a child's needs are best met by following an alternative plan, including coverage of the content from a previous year, this will be overseen by the SENCo, in collaboration with the class teacher and with the knowledge of SLT. Specific arrangements for the provision of children with SEND will be communicated to parents and carers during SEND reviews.

6. Cross Curricular Links

Where relevant, teachers will plan for cross-curricular links between Mathematics and other subject areas. These Mathematics links may be taught additionally to the daily Mathematics lesson. For example, in a geography lesson, the children might learn about conversion between miles and kilometres when measuring the distance between the countries they are studying. In Science, children might be asked to interpret or display data on a variety of tables and charts. This means that children can appreciate the relevance and importance of Mathematics in the wider world and everyday life. The teachers' themed topic webs will clearly display the cross-curricular opportunities planned for.

IMPACT

The school has a supportive ethos and our approaches support the children in developing their collaborative and independent skills, as well as empathy and the need to recognise the achievement of others. Students can underperform in Mathematics because they think they can't do it or are not naturally good at it. The Power Maths programme addresses these preconceptions by ensuring that all children experience challenge and success in Mathematics by developing a growth mindset. Regular and ongoing assessment informs teaching, as well as intervention, to support and enable the success of each child.

7. Assessment & Recording

Assessment for Learning:

Children receive effective feedback through teacher assessment, both orally and through written feedback in line with the learning objective.

- Learning objectives are shared with the children prior to independent work and feedback is in line with the learning expectations of the lesson.
- At the end of the lesson, the children review their work against the learning objective through the reflect activity.



- Teachers will mark the work with a V or G if the work has been guided or verbal feedback has been given (Please see Marking Policy). Please and Now comments will be added if necessary to the children's work for completion at the beginning of the next lesson.
- Pupil and Parent Voice are also collected in periodically throughout the year by the subject co-ordinator and carefully analysed so as to gauge children's and parent's attitudes, as well as make pupils and parents feel confident that their views are listened to.

Formative Assessment:

Short term assessments are part of each lesson. Observations and careful questioning enables teachers to adjust lessons and brief other adults if necessary. The lesson structure of Power Maths is designed to support this process and the Reflect task at the end of each lesson also allows for misconceptions to be addressed. Teachers also use our school assessment system (ALPS) to keep track of children's achievements and progress after each topic taught. Data is collected at the end of every term (in the form of Venn diagrams and Trackers) by the class teacher and handed to the Assessment Co-ordinator. It is then analysed to assist Pupil Progress Meetings where then any necessary interventions, support or challenge are put in place.

At the end of each blocked unit of work, the children complete a short end of unit check. This consists of five varied questions and an opportunity to demonstrate greater depth. There is a subsequent related task which allows for more open ended outcomes to give further indication of the depth of each child's understanding.

In EYFS, observations of the children are made throughout the week by the teacher and the TA. These observations will either be shared on Tapestry to parents enabling them instant feedback and updates on their child's learning and development each week or stuck into their Learning Journey.

Summative Assessment:

Teachers administer a termly PUMA paper for each child. The results of these papers are used to identify children's ongoing target areas as well as their standardised Math's age, which are communicated to the children, as well as to parents and carers at Parents Evening. They are also used to inform the whole school tracking of attainment and progress for each child on the summative tab of ALPS.

8. Monitoring

The subject leader and the Head teacher will regularly monitor standards by using methods such as work scrutiny, learning walks and moderation within school and across local schools. The subject coordinator is also responsible for supporting colleagues in their teaching, being informed about current developments in the subject, and providing a strategic lead and direction for Mathematics in the school. Formal assessment results will be used to track the progress of children and to set whole school targets. The Mathematics subject leader will also keep an up to date Subject Leader File with current data, photographs of Mathematics events in school, as well as school displays and pupil voice. As teachers update Mathematics



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assessments on ALPS based on the coverage taught, this data will then be monitored by the Mathematics Co-ordinator who can assess the attainment across the school.

The Mathematics Co-ordinator will meet at least annually with their subject governor to make them aware of developments in the subject and levels of attainment across the school.

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