Christopher Pickering Primary School

Be the Best you can Be!

Mathematics Policy 2022-2023



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Maths Leaders: T. Yardley and J Coulter

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RESPECT

Respectfulness, Enthusiasm, Self-belief, Perseverance, Empathy, Curiosity, Tolerance

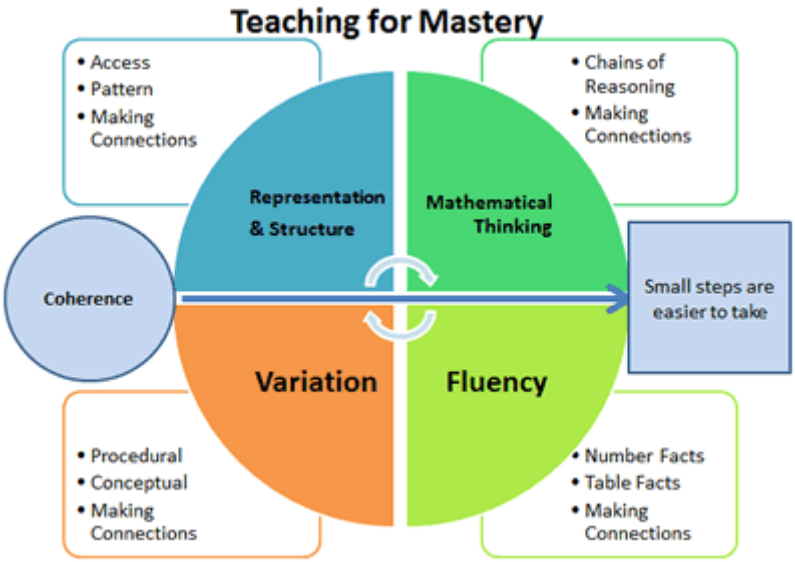
Intent:

At Christopher Pickering Primary School, we view mathematics as 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, and a sense of enjoyment and curiosity about the subject.

Our intent is to provide children with a mathematics curriculum that will allow them to become confident individuals through developing their mathematical skills to their full potential. We also aim to present maths as a challenging, exciting, creative and relevant subject in order to promote a positive and confident attitude.
In line with the National Curriculum (2014), our overall intent focuses on all pupils being able to:

- Use and understand a wide range of appropriate mathematical language to discuss, explain and justify their mathematical thinking and reasoning.
- Explore and deepen their mathematical understanding through a C-P-A approach, allowing exploration, acquisition of fluency skills and application of skills to a range of problems and lines of enquiry.
- Become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- Move fluently between different representations of mathematical ideas.
- Reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- Solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.
- Make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems.
- Apply mathematical knowledge across the curriculum in science and other subjects relating mathematical knowledge and skills to real life situations.
- Access challenges of rich and sophisticated problems when they grasp fluency concepts rapidly rather than progressing to new content.
- Consolidate learning and concepts through repetition and intervention to acquire sound foundations for fluency of mathematics.

Maths Mastery at Christopher Pickering



At Christopher Pickering Primary School, we follow the National Curriculum for Maths using the Maths Mastery approach to teaching. Mastery of mathematics is something that we want pupils - all pupils - to acquire, or rather to continue acquiring throughout their school lives, and beyond.

Since mastery is what we want pupils to acquire (or go on acquiring), rather than teachers to exhibit, we use the phrase 'teaching for mastery' to describe the range of elements of classroom practice and school organisation that combine to give pupils the best chances of mastering mathematics.

Mastering maths means acquiring a deep, long-term, secure and adaptable understanding of the subject. At any one point in a pupil's journey through school, achieving mastery is taken to mean acquiring a solid enough understanding of the maths that has been taught to enable him/her move on to more advanced material.
Much of the NCETM's work training teachers has been based on Five Big Ideas under pinning teaching for mastery:

Five Big Ideas in Teaching for Mastery

A central component in the NCETM/Maths Hubs programmes to develop Mastery Specialists has been discussion of Five Big Ideas, drawn from research evidence, underpinning teaching for mastery. This is the diagram used to help bind these ideas together:

Coherence: Connecting new ideas to concepts that have already been understood, and ensuring that, once understood and mastered, new ideas are used again in next steps of learning, all steps being small steps

Representation and Structure: Representations used in lessons expose the mathematical structure being taught, the aim being that students can do the maths without recourse to the representation

Mathematical Thinking: If taught ideas are to be understood deeply, they must not merely be passively received but must be worked on by the student: thought about, reasoned with and discussed with others

Fluency: Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics

Variation: Varying the way a concept is initially presented to students, by giving examples that display a concept as well as those that don't display it. Also, carefully varying practice questions so that mechanical repetition is avoided, and thinking is encouraged.

How is Maths Taught at Christopher Pickering?

Fluency Skills– To develop children's fluency, short counting sessions take place. Children practise counting forwards and backwards and in steps of different sizes, including fractions and decimals in later years.

Discrete Maths Lessons – Most of the number aspects of the curriculum are taught through discrete Maths lessons. We are working towards a mastery approach to teaching mathematics. This means that we focus on topics, such as place value or addition, for a longer period to enable pupils to gain a deeper understanding of the mathematical concepts. These are then revisited throughout the year and applied to other areas. Children are given opportunities to develop fluency, reason mathematically and solve problems. These lessons are delivered through Mastering Number programme for FS and KS1, as well as several same day interventions throughout the school.

Cross-Curricular Maths – Many aspects of the curriculum, especially Measurement, Geometry and Statistics are taught through a cross-curricular approach. There are particularly strong links with Computing, Science, Geography and Art.

Models and Images – To support children's conceptual understanding, we use a range of models and images, including Numicon, straws, bead strings, place value counters, number lines, fraction boxes, Dienes' apparatus. Bar Models and Part-Whole models are used throughout year groups.

Speaking and Listening – Children are given frequent opportunities to discuss their mathematical thinking and articulate their reasoning. STEM sentences are encouraged in children of all ages, to repeat mathematical concepts to embed understanding.

Early Morning Maths – Children in KS1 and KS2 keep all maths topics current by doing early morning maths challenges during registration time.

Full information about progression in maths skills through the year groups is available in this document: Maths Progression YR1-6

Organisation and Teaching Approaches

A typical lesson involves all classes following the White Rose Long term plan and the small steps. Questions are carefully crafted to develop children's fluency, reasoning, and problem solving skills and conceptual understanding for mastery. It focuses on core topics to build deep understanding. Teachers prepare work for the children adopting the White Rose long

term plan but providing a variety of fluency and conceptual variation for the children to progress and then apply to solve problems which are enhanced from providers such as the NCETM, Third Space Learning and NRICH. The Ready to Progress Criteria is also embedded to ensure that children are ready to progress to the next year group. All children throughout the school have access to either Numbots or Times Tables Rock Stars and

End Points

By the end of EYFS children will:

Have a secure understanding of Number and Numerical Patterns across the EYFS Framework. Children will have a deep understanding of numbers to 10, being able to develop their skill of subitising up to 5 as well as automatically recalling number bonds up to 5 and even 10. Furthermore, children will be able to verbally count beyond 20, recognising the counting system, comparing quantities up to 10 in various contexts and exploring and representing numbers within 10, including odds, evens and doubles. The EYFS children will use every day language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects in order to help them solve problems. They will recognise, create and describe patterns, exploring characteristics of everyday objects and shapes, using their mathematical language to describe them.

By the end of Key Stage 1 children will:

Develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources, e.g. concrete objects and measuring tools. Pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. They should also use a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money. By the end of year 2, pupils should know their number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency. Pupils should read and spell mathematical vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

By the end of Lower Key Stage 2 children will:

Become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. They will develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. Pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Pupils will have the opportunity to draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number. By the end of year 4, pupils should have instant recall of their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work. Pupils should read and spell mathematical vocabulary correctly and confidently using their growing word reading knowledge and their knowledge of spelling

By the end of Upper Key Stage 2 children will:

Extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio. Pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Pupils will classify shapes with increasingly complex geometric properties and that they learn the required vocabulary they need to describe them. By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages. Pupils should read, spell and pronounce mathematical vocabulary correctly.

Implementation

- A maths lesson lasts for 60 minutes. This mostly happens in a highly scaffolded way, enabling all children to develop critical thinking skills, make mathematical connections and become confident mathematicians. Activities will promote deep mathematical understanding. After a concept has been introduced, children will have the opportunity to practice it. This allows the teacher to support those who are not confident and allows other adults in the room to support the children who may need a little extra support. Mini inputs during the lesson allow children to access and practise each coloured task in their books. A day's learning has a range of fluency, reasoning and problem solving tasks. Children start on a green task, then move to amber, red and purple within a lesson.

- At the end of the 60 minutes, children will then self-assess their work by placing their books on red, amber or green.
- The teacher identifies the groups for the SDI and appropriate intervention is given.

Same-Day Intervention (SDI)

- During the same day intervention, pupils who fully achieved the learning objective are able to move on to the deeper learning tasks, including open-ended challenges. These activities develop the deep understanding required for mastery. These children may work with the class teacher or a TA.

- Those who require additional support will work with the class teacher and will have an intervention to address their misconceptions. This lasts for approximately 15-20 minutes.

Although this is a typical maths lesson, we know there are times when there needs to be flexibility within the lesson to meet the needs of groups or individual children, for example,

mini plenaries throughout the lesson, additional mental and oral sessions, extended main activities, etc.

Maths in the Foundation Stage aims to build basic skills which will be built upon in later years, objectives are taken from The 2020 Development Matters and the EYFS Framework. Areas of provision within the classroom support maths, ensuring children are able to access throughout the day to practise and develop skills being taught. In addition, consistent maths lessons take the form of direct teaching, which is followed up by enhanced activities placed in areas of provision in the classroom which may be accessed independently or supported by an adult.

Teaching and Learning

Teaching in maths should develop pupil's understanding of important concepts, techniques and recall of facts, enabling children to work independently. Opportunities are provided for problem solving in different contexts, discussion and investigations. These should be done in a creative and imaginative way, making links to other areas of study, real life, books and the outdoor environment.

This ensures that teaching is done using an appropriate range of resources and teaching strategies.

Planning

We have adopted the White Rose Maths scheme, which follows the new curriculum; staff will follow the 'small steps' guide. Alongside this we have also correlated the NCETM spine link references and the Ready to progress criteria allowing teachers to change and adapt the small steps to suit the needs of the learners. Weekly planning will be based on the Maths Long Term Plans. Teachers will use the end of year statements to identify gaps and to inform their planning to ensure pupil progress. Planning will be shared with support staff each day.

Resources

The New Curriculum Framework is our main planning and teaching resource, learning objectives for teaching in the daily maths lesson will be from this.

In order to support the delivery of maths lessons to all pupils the school has a large range of resources available. Within the classroom each set of tables should have maths resources available to children at all times, these include basic resources such as number lines, 100 squares, rulers, counters, numicon, etc. Other specific resources (eg, balance scales, meter rulers) are stored in our Phase Areas/cupboards.

We have subscriptions to White Rose Premium Resources, Third Space Maths Hub, Testbase, Times Tables Rockstars and Numbots to support teachers and learning from home.

Monitoring Teaching and Learning

This will be undertaken by the Subject Leaders and other members of SLT.

Areas to be monitored will be decided at the beginning of each term and will be recorded on the Monitoring Timetable so that staff are informed. Results of any monitoring will be fed back to staff quickly and to SLT at their meetings so that any action required can be carried out effectively.

Assessment, Feedback and Record Keeping

Assessment will be ongoing throughout the school year. Staff will use the end of year statements to assess half termly and additional support or challenge will be identified early by class teachers and the SLT. Marking should be in line with the school's Marking and Feedback Policy.

Inclusion

Pupils with special educational needs and EHCPs:

- Within the daily mathematics lesson teachers provide activities to support children who find mathematics difficult. Children with SEN are taught within the daily mathematics lesson and are able to take part at their level through the support of a Teaching Assistant and appropriate activities and resources.
- Where applicable children's EHCPs incorporate suitable objectives from the planning documents.
- Intervention Groups will take place at times throughout the year, in order to give further support to children working below national expectations.
- In extreme cases, children will access Maths through our HUB support. Here, children work closely with SEN trained staff to access a variety of maths appropriate to the child's personal needs.

Greater Depth Children

Within the daily mathematics lesson, teachers provide activities to support and challenge children who are more able in maths. They are taught within the daily mathematics lesson and are able to take part at their level through the challenge of the activity, sometimes with the support of a Teaching Assistant and other appropriate activities and resources, which the teacher plans into the daily maths lesson. See 'blue challenges' in Maths books.

Equalities

All children at Christopher Pickering have an equal entitlement to access the new Maths curriculum and make progress in order to attain the best they can in the subject.

How to Help Your Child at Home

Children at Christopher Pickering are set Maths homework by their teacher that links to the work they are doing in class. Early Years and Y1 have Numbots – an online programme they can have access to at home. Y2 upwards can access TT Rockstars. Also there are numerous maths games through Purple Mash that children have log in details for. There is an array of Maths websites suggested to parents on our school website.

Home is an ideal place for children to apply the Maths they have learned in school to real-life situations. This may involve measuring quantities for baking; Counting place settings when setting the table; sharing sweets out equally or recognising patterns around us.

The Maths Co-ordinators

Terrie Yardley and Jane Coulter are the Mathematics co-ordinators and oversee the teaching and learning of Maths at Christopher Pickering. They also work closely with other schools, including Maths co-ordinators at other schools across the Humber Education Trust and schools in Hull.

Some priorities for this year include:

- supporting teachers in implementing the maths mastery approach to teaching
- the use of maths interventions to plug children's learning gaps
- Encouraging all learners to use concrete manipulatives to aid their learning
- Enrichment - we aim to provide children with rich and exciting Mathematics throughout their Maths lessons at Christopher Pickering. As a school, we are looking at ways of promoting deep learning to challenge all children.