Cheadle Heath  Primary School

WHOLE SCHOOL MATHS POLICY

Autumn 2020

November 2020	3.0	Reviewed and updated in line with school practices. Agreed by governors at full Governing Board meeting 08.12.20	Abbie Campbell Shirley Ralph	Next review Autumn 2022
Autumn 2018	2.0	Reviewed and updated in line with new curriculum guidance	Amnah Iqbal	
Autumn 2016	1.0	Reviewed and updated in line with Curriculum 2014	Carrie Anne Hulbert	

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1. Curriculum Statement

Intent

The 2014 National Curriculum for Maths 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 Cheadle Heath, we teach for fluency and a deep understanding of mathematical concepts. We aim for children to develop into confident mathematicians who are curious to explore, question and reason mathematically.

Implementation

The content and principles underpinning the 2014 Mathematics curriculum and the Maths curriculum at Cheadle Heath reflect those found in a mastery approach. Mastery is an approach to teaching mathematics that is fully inclusive. This means that we do not believe that individuals have a fixed mathematical ability. We believe that all pupils have the potential to become mathematicians through participating in carefully designed maths lessons. To achieve this, our curriculum provides opportunities for all pupils to reason and problem solve, to articulate their thinking and work on sophisticated challenges both independently and collaboratively. Our mastery approach supports children to develop both procedural and conceptual understanding, with sound 'number sense' and ability to recall and calculate efficiently. At Cheadle Heath, we use a small step approach to develop mathematical thinking and support children in linking mathematical concepts.

These principles and features characterise this approach and convey how our curriculum is implemented:

- 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.
- 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.

To ensure consistency and progression, the school uses the White Rose maths scheme and has an ongoing engagement with the DFE funded Maths Hubs programme. This is to ensure that all members of staff understand the pedagogy of the approach.

In KS1, the White Rose Scheme supports teachers in delivering lessons that incorporate the elements of mastery. The White Rose schemes of learning are influenced and informed by the work of leading maths researchers and practitioners. They provide teachers with a vast bank of clear, practical resources and suggested framework for small, coherent steps in learning. The scheme also promotes a culture of deep understanding, confidence and competence in mathematics.

In KS2, in addition to using the White Rose schemes, the school uses an evidence based Same Day Intervention programme, which the school has trialled in conjunction with other schools in the Yorkshire and Humber Maths Hub. This programme is influenced by high-performing Shanghai schools, where teachers aim to address misconceptions as soon as they arise. It fits with existing toolkit evidence on feedback, mastery learning, teaching assistants and meta-cognition. The Same Day Intervention has been delivered within the Outwood Grange Academies Trust and schools outside this through the Maths Hub, with indicative results showing the programme is feasible and promising. As a result further funding for this initiative has been provided by the Education Endowment Fund (EEF). The aim is to use the additional support to ensure that all children reach a certain level of understanding by the end of the day, preventing an achievement gap from forming.

In both KS1 and 2 Mathematical topics are taught in blocks, to enable the 3 achievement of 'mastery' over time. Each lesson phase provides the means to achieve greater depth, with more able children being offered rich and sophisticated problems, as well as exploratory, investigative tasks, within the lesson as appropriate.

Discrete fluency lessons are taught across the school. These lessons focus on key number skills and methods of calculation which are pertinent to particular year groups using the National Curriculum guidance on progression in calculation methods (refer to school calculation policy).

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 mastery approach at Cheadle Heath 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. As a result, in KS2 children's progress from KS1 to KS2 is above that nationally. In school data indicates that the percentage of children progressing to a greater depth of Mathematical understanding is increasing when compared to their end of KS1 data.

2. Teaching and Learning

In both Key Stages, children are taught in mixed ability groups or pairings. At the start of a lesson the teacher has no fixed concept of what a child can or can't do and all children are viewed with flexible mathematical ability. Adult and peer support are used throughout the lesson, when and where necessary but the expectation is that all children work independently at some point. A range of inclusion strategies, are embedded in practice and teachers are aware of the special educational needs of the children in their Maths class, as well as those who have English as an additional language.

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, this will be overseen by the SENDCo, in collaboration with the class teacher and with the knowledge of SMT.

KS1

In KS1, the children are currently in three mixed Y1/2 classes. To ensure that all children are taught the content for their year group, the structure of the maths lesson is:

Week A	**Year 1**	**Year 2**
Part A	Fluency Task supported by TA	Input (ping-pong) with Class Teacher
Part B	Input (ping-pong) with Class Teacher	Independent task linked to teacher input
Part C	Independent Task linked to teacher input	Challenge or additional support
Week B	**Year 2**	**Year 1**
Part A	Fluency Task supported by TA	Input (ping-pong) with Class Teacher
Part B	Input (ping-pong) with Class Teacher	Independent task linked to teacher input
Part C	Independent Task linked to teacher input	Challenge or additional support

The teacher input (ping-pong) is the modelling part of the lesson and is an 'I do, you do' approach based on Shanghai methods. The input is carefully planned to follow small, coherent steps in learning. 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 input session gradually leads to the independent activity which reflects the steps that have been taught and uses conceptual and procedural variation to build fluency and develop greater understanding of underlying mathematical concepts.

KS2

In KS2, a typical lesson using a Same Day Intervention approach lasts approximately 1 hour and 15 mins. Same Day Intervention (SDI) is an approach to teaching maths where teachers adapt their classroom style based on Shanghai methods, for example using frequent modelling and an 'I do, you do' approach in initial class teaching (ping-pong). After a 30-minute lesson, pupils answer some questions independently (diagnostic) and then have 15 minutes away from their teacher (attending assembly or a teaching-assistant-led activity) while the teacher marks their answers using a rapid marking code. The remaining 30 minutes of the lesson involve a gold (greater depth), silver (age related expectations) or an intervention session with the class teacher. The teacher provides immediate feedback to the children and groups them together based on how they answered the questions so that they can efficiently address common misconceptions.

As acknowledged by the Education Endowment Fund (EEF) and the Yorkshire and Humber Maths Hub programme – The Same Day Intervention programme is influenced by high-performing Shanghai schools, where teachers aim to address misconceptions as soon as they arise. It fits with existing toolkit evidence on feedback, mastery learning, teaching assistants and meta-cognition. The Yorkshire and Humber Maths hub is funded by the DfE and coordinated by the National Centre for Excellence in the Teaching of Mathematics (NCETM). In KS2, teachers use a range of resources to develop mastery of Mathematics. The teachers:

- Make use of concrete manipulatives and pictorial representations that help learners to uncover and articulate mathematical structure.
- Craft lessons so that mathematical talk is encouraged.
- Use the principles of intelligent practice when choosing or writing questions.
- Promote a positive can-do mind-set that expects to learn from mistakes.
- Provide enjoyable and engaging tasks that build skills and allow misconceptions to be diagnosed.

Fluency

In KS1, fluency lessons are taught as a recap and revisit session at the beginning of a lesson (see table above). Teachers also take opportunities throughout the day to address key number knowledge and skills. In KS2, fluency sessions often take the format of a fluency in 5 task, followed by shared discussion and marking. These lessons focus on key number skills and methods of calculation which are pertinent to particular year groups using the National Curriculum guidance on progression in calculation methods (refer to school calculation policy).

3. Assessment

3.1 Assessment for Learning (AfL)

Children receive effective feedback through teacher assessment, both orally and through written feedback, and AfL is integral to the design of each lesson:

- The structure of the teaching sequence, ensures that children know how to be successful in their independent work. Guided practice, which takes place within the 'ping-pong' part of the lesson, provides further preparation for children to be able to apply the skills, knowledge and strategies taught during the independent tasks. Common misconceptions are addressed within the teaching sequence and key understanding within each 'small step' is reviewed and checked by the teacher and the children before progression to further depth. Children will be grouped based on assessment during the lesson in both Key Stages.

- At the end of the lesson, the children review their work and self and peer assessment is used. Opportunities for additional practice and correction are provided by the teacher, as appropriate, during marking, with a focus on promoting and achieving a growth mindset within the subject.

3.2 Formative Assessment

Short term assessment is a feature of each lesson. Observations and careful questioning enable teachers to adjust lessons and brief other adults in the class if necessary. The lesson structures are designed to support this process and also allows for misconceptions to be addressed. At the end of each blocked unit of work, the children also complete the carefully aligned White Rose Maths 'End of Block Assessment'. The outcome of this is used by the teacher to ensure that any identified gaps in understanding can be addressed before the next unit is taught. This informs the judgements made at the end of the term as to the extent that each child has demonstrated mastery of each 'fundamental' objective.

3.3 Summative Assessment

Teachers administer a termly arithmetic paper and reasoning and problem-solving paper which specifically links to the coverage for that term. The results of these papers are used to identify children's ongoing target areas. They are also used alongside the end of unit assessments and outcomes of work, to inform the whole school tracking of attainment and progress for each child in line with each 'fundamental' objective. Assessment data in maths is reviewed throughout the year to inform interventions and to also ensure that provision remains well-informed to enable optimum progress and achievement. End of year data is used to measure the extent to which attainment gaps for individuals and identified groups of learners are being closed. This data is used to inform whole school and subject development priorities for the next school year.

4. Planning and Resources

All planning stems from the National Curriculum 2014. Work is then planned in discrete blocks based on the White Rose Hub scheme of learning. The order and the length of time spent on each unit is down to the discretion of the year group teachers, who plan together. For example, measure may be integrated into other topics such as addition or subtraction, rather than being taught discretely as a unit. Where necessary, a year group may take longer than expected on a particular unit based on the level of the children's understanding.

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; place value counters and grids; money or coins; measuring equipment for capacity, mass and length; 5 bead strings; the interactive whiteboards and related software; 3D shapes and/or nets; Numicon and related resources and software; 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 also available as part of a central supply. Resources to support teachers' own professional development and understanding of new approaches as part of a mastery approach are available on NCETM and White Rose websites. As well as overviews of learning, these include short videos which demonstrate new methods to ensure accuracy.

Teachers are encouraged to use the school playgrounds as an outdoor classroom when possible, for example, when teaching length, area or perimeter. The school also subscribes to Third Space Learning and Classroom Secrets for additional resources, both of which are aligned to the White Rose Hub Maths scheme of learning.

5. Organisation

As discussed in the planning and resources section, all organisation of work stems from the National Curriculum 2014. Work is then planned in discrete blocks based on the Whiterose Hub scheme of learning. The order and the length of time spent on each unit is down to the discretion of the year group teachers, who plan together. For example, measure may be integrated into other topics such as addition or subtraction, rather than being taught discretely as a unit. Where necessary, a year group may take longer than expected on a particular unit based on the level of the children's understanding.

The school uses a blocked curriculum approach to the teaching of Mathematics. This ensures that children are able to focus for longer on each specific area of Maths 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 Maths 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.

6. EYFS

Children in Nursery and Reception have short Maths carpet teaching sessions, during which time they begin to develop their understanding of simple mathematical concepts such as counting to 20, maintaining 1 to 1 correspondence, simple addition and subtraction facts, to recognise and describe simple 2d and 3d shapes. Children are taught these concepts using physical resources, pictorial resources, songs, games and role-play. Maths is linked throughout the activities in continuous provision for example use of everyday mathematical language, shape, space and measure.

We recognise the importance of play-based learning and therefore encourage children to develop their understanding during their play. Such opportunities are provided in both the inside and outside environment. Regular observations and assessments help to ensure that children that need additional intervention to consolidate their mathematical understanding are identified and supported by appropriate interventions.

7. Equal Opportunities

The 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.

8. Inclusion

Taking a mastery approach, differentiation occurs in the support and intervention provided to different children, not in the topics taught, particularly at earlier stages. The National Curriculum 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, immediately within the Maths lesson or later the same day.

A range of inclusion strategies, are embedded in practice and teachers are aware of the special educational needs of the children in their Maths class, as well as those who have English as an additional language. 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 SENDCo, in collaboration with the class teacher and with the knowledge of SMT. Specific arrangements for the provision of children with SEND will be communicated to parents and carers during SEND reviews.

9. Role of the Subject Leader

- The subject leader will raise the profile of Maths at Cheadle Heath Primary School through best practice. They will model lessons, as appropriate to new staff, NQTs and peers to support continued professional development. The subject leader will support staff in providing opportunities for learning outside the classroom in Maths and will identify and organise opportunities which enable this, as appropriate.

- The subject leader will monitor progression and continuity of Maths throughout the school through lesson observations and regular monitoring of outcomes of work in Maths exercise books.

- The subject leader will ensure that all staff have access to year group plans and the relevant resources which accompany them.

- The subject leader will monitor children's progress through the analysis of whole school data. They will use this data to inform the subject development plan which will detail how standards in the subject are to be maintained and developed further.

- The subject leader will, on a regular basis, organise, audit and purchase central and class-based Maths resources.

- Through ongoing involvement in the DfE funded Maths Hubs programme, the subject leader will keep up to date on current developments in Maths education and disseminate 8 information to colleagues. They will also contribute directly to the Maths Hubs programme, as a mastery specialist, with the longer-term aim that the school becomes a recognised centre for excellence in the teaching of mastery.

- The subject leader will extend relationships and make contacts beyond the school.

- The subject leader will develop opportunities for parents/carers to become more involved in Maths education.

- The subject leader will ensure that all staff have access to professional development including observations of outstanding practice in the subject.

10. Parents

- The school recognises that parents and carers have a valuable role to play in supporting their child's mathematical learning. An overview of the Maths curriculum is available on the school's website, as well as guidance in the progression in calculation methods used by the school. Paper copies of these documents are also available on request and the curriculum letter, sent home by each year group, also outlines the Maths topics to be covered.

- Children are encouraged to use Numbots and TT-Rockstars at home to increase Mathematical fluency.

- Parents are informed of their child's progress at Parents Evenings and this is also communicated in written school reports.

- Parents and carers are encouraged to speak to their child's Maths teacher at any point during the year, either informally or by making a specific appointment. Information about their child's standards, achievements and future targets in Maths is shared during parent/carer meetings, as well as ways that parents/carers may be able to assist with their child's learning.