

The Mathematics Curriculum

At Cheadle Heath, we teach for fluency and a deep understanding of mathematical concepts. We aim for pupils to develop into confident mathematicians who are curious to explore, question and reason mathematically. We use a mastery 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 pupils to develop both procedural and conceptual understanding, with sound 'number sense' and ability to recall and calculate efficiently.

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

- Teachers reinforce an expectation that all pupils are capable of achieving high standards in Mathematics.
- The large majority of pupils 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 pupils regularly to identify those requiring intervention, so that all pupils 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 EYFS, we are participants in the Mastering Number Programme, which is supported by the NCETM. This project aims to secure firm foundations in the development of good number sense for all pupils.

In both KS1 and 2 Mathematical topics are taught in blocks, to enable the achievement of 'mastery' over time. Each lesson phase provides the means to achieve greater depth, with more able pupils 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.

The school has a supportive ethos and our approaches support the pupils 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 pupils 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.

Teaching and Learning

EYFS

In EYFS, pupils are taught in line with the Early Years Foundation Stage Framework and begin to develop their understanding of simple mathematical concepts. Pupils are taught these concepts using physical resources, pictorial resources, songs, games and role-play. 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 pupils that need additional intervention to consolidate their mathematical understanding are identified and supported by appropriate interventions.

In addition, pupils are also taught using the NCETM Mastering Number Programme which enables them to continually focus on developing a strong 'number sense'.

KS1 & KS2

In Key Stage 1 and 2, pupils 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 pupils 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 pupils 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 pupils in their Maths class, as well as those who have English as an additional language.

Although the expectation is that the majority of pupils 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 pupils' 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.

Lesson structure

KS1

The teacher input (ping-pong) is the modelling part of the lesson and takes 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, the approach to teaching for the first part of the lesson (consistent with KS1) is an 'I do, you do' approach (ping-pong) which enables opportunities for frequent modelling and practise as well as time to address misconceptions which may arise. The input will follow small, coherent steps that have been carefully constructed to enable support and gradual progression for all pupils. After the ping-pong session, pupils will move onto an independent activity which directly reflects and links to the steps that have been taught in the initial part of the lesson. The teacher and teaching assistant provide immediate feedback and offer support to pupils based on formative assessment strategies. Those pupils who complete the independent task successfully are able to move onto an extension task with the aim for them to develop a deep understanding of the given concept/objective.

Fluency

In EYFS, the NCETM Mastering Number Programme enables pupils to continually focus on developing a strong 'number sense' and allowing pupils to have strong foundations before moving onto the Year 1 curriculum. 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 tasks, 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).

Assessment

Assessment for Learning (AfL)

Pupils 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 pupils 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 pupils 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 pupils before progression to further depth. Pupils will be grouped based on assessment during the lesson in both Key Stages.
- At the end of the lesson, the pupils 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.

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 pupils 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.

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 pupils' 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.

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 pupils' 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 pupils 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 pupils 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 pupils 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.

Equal Opportunities

The school is committed to ensuring the active participation and progress of all pupils in their learning. All pupils 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.

Inclusion

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

There is little differentiation in the content taught but the questioning and scaffolding individual pupils 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. Pupils' 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 pupils in their Maths class, as well as those who have English as an additional language. Although the expectation is that the majority of pupils 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 pupils' 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, LSS and with the knowledge of SLT. Specific arrangements for the provision of pupils with SEND will be communicated to parents and carers during SEND reviews.

Parental Engagement

The school recognises that parents and carers have a valuable role to play in supporting their child's mathematical learning. Pupils 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/carers meetings, as well as ways that parents/carers may be able to assist with their child's learning. Parents are invited to attend 'stay and learn' maths lessons at school.