

Maths Policy



The Grange Primary School

Subject Leadership Team

The maths team is comprised of a member of staff (detailed below) from across the key stages.

F Mawson	Maths Leader, Assistant Headteacher
A Chowdhury	Y6 teacher
J Fanthorpe	FS1 leader

Curriculum Aims

The aims of The Grange Primary School reflect those of the 2014 National Curriculum for maths, which are that children:

- 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.
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- can **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.

Progression through the curriculum

By the end of year 6, children are expected to be 'secondary ready'. To achieve this, children not only need to be fluent in their knowledge and recall of mathematical facts, but they also need to be competent and confident to be able to reason with and investigate concepts and also be able to apply them to solve problems. Therefore, once children become fluent in concepts at their year group/ stage in maths, they will then apply these concepts across the curriculum and use them for reasoning and solving problems. When they are able to do this, it is then that they are considered by the teacher to be fully secure in their knowledge and understanding at that stage.

The expectation is that the majority of children will move through the curriculum at broadly the same pace. However, decisions about when to progress should always be at the discretion of the teacher and based upon assessments regarding the security of pupils' understanding. Pupils who grasp concepts quickly should not be accelerated onto the next stage of maths curriculum content, but instead they should be challenged through rich and sophisticated problems in different contexts. Those who are not sufficiently fluent in earlier material should consolidate their understanding, including through intervention before moving on.

The National Curriculum 2014 is designed as a year by year programme of study. At The Grange Primary, we call these 'Stages' of learning. The year 1 programme of study therefore is named 'stage 1' and so on.

We assess children using the content and concepts at each stage of the curriculum. We also assess children's skills at reasoning with these concepts and their ability to use them to investigate, solve problems and apply them across the curriculum.

We split each stage into 4 sub-stages to assess where the children are working within the curriculum. Children can be working within a stage at either: emerging, developing, securing or masters. Children who are secure at their stage will have an understanding of the mathematical concepts and will be working on more complex problem solving and application of these skills. They will also be dedicated peer tutors to support other children with their learning.

For more information on the National Curriculum 2014 and the expectations for each stage, please visit the Government website:

<https://www.gov.uk/government/publications/national-curriculum-in-england-mathematics-programmes-of-study>

The maths section of the Grange Primary School website also has details of expectations stage by stage:

<http://gljs.co.uk/northlincs/primary/gljs/site/pages/subjects/maths>

Maths in the Foundation Stage:

Opportunities are provided for children to learn and develop their key mathematical knowledge, skills and understanding through purposeful play and learning experiences, with a balance of adult-led and child-initiated activities.

Foundation Stage staff use observations as the basis for planning. These observations then lead the direction of the planning. The staff use the children's interests to plan, the seasons of the year and key events noted on the Long Term Plan. In addition to this the children lead the short term activity planning on a day to day basis. This fostering of the children's interests develops a high level of motivation for the children's learning. The planning objectives within the Foundation Stage are from the Development Matters Statements from the Early Years Foundation Stage document. We make regular assessments of children's learning and we use this information to ensure that future planning reflects identified needs.

Through play our children explore and develop learning experiences, which help them make sense of the world. They practise and build up ideas, and have the opportunity to think creatively alongside other children as well as on their own. They communicate with others as they investigate and solve problems.

The Foundation Stage has free flow between the inside and the outside learning areas which has a positive effect on the children's development. Being outdoors offers opportunities for children to explore and apply mathematical concepts in practical ways through construction and gardening for example.

At The Grange Primary we work closely with parents and carers to support children's learning and development. Parents and carers have opportunities to speak with staff regarding their child's progress and are provided with access to Tapestry, the online assessment system for the Foundation Stage.

All staff involved with the EYFS aim to develop good relationships with all children, interacting positively with them and taking time to listen to them. Strong links have been developed with the children's centre, various feeder pre-schools and child-minders and the Foundation Stage staff meet with providers to discuss each individual child and their transition process into school.

Assessment in the Foundation Stage takes the form of both formal and informal observations and recorded on an online Learning Journey (Tapestry). Rainbow Challenges are set for children linking to the objectives for maths to ensure that children are involved and aware of their own learning and progress in maths. Children are rewarded with a rainbow bead upon successfully completing a mathematical challenge each week.

In the Foundation Stage, mathematics should involve providing children with opportunities to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shapes, spaces and measures.

In number: children count reliably with numbers from 1-20, place them in order and say which number is 1 more or 1 less than a given number. Using quantities and objects, they add and subtract two single digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.

In shape, space and measures: children use every day language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.

The CPA approach should be introduced in the Early Years. Stories should be used as a pre requisite to a number sentences and missing number problems. Mastery should be developed through variation of representations for number, e.g. the use of numicon and spot patterns should be considered.

Towards the end of the foundation stage, to support with transition, all children should gain experience of teacher led/ whole class learning at tables. Transition in maths should focus on mastery of the Early Learning Goals for maths to prepare them for the Y1 curriculum. Further guidance for transition should be taken from the Bold Beginnings document. For example, children should master and be fluent with the fact families and number bonds to 10 before moving on.

Maths in Key Stage 1

The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole number, counting and place value. This should involve working with numerals, words and the four operations including with practical resources.

At this stage pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using 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 the number bonds to 20 and be precise in using and understanding place value. Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

In Key Stage 1, the Singapore teaching approach is used and embedded. This involves presenting concepts to children in a variety of ways and spending a longer period of time focusing on concepts to ensure that they are embedded. A ping pong approach to teaching is utilised to generate deeper thinking and reasoning dialogue. Ensuring that children follow the concrete, pictorial, abstract approach to learning, enables them to then access mastery and greater depth challenges.

Teachers in KS1 are expected to use the Inspire Maths resources and workbooks to support their planning and enhance it using their own knowledge, skills and expertise and other resources, including Maths No Problem and Powermaths.

Maths in Key Stage 2

The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils 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 memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work. A times table screen will be introduced in the summer of 2020.

Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing work reading knowledge and their knowledge of spelling.

Teachers in Year 3 and 4 should continue to employ the Singapore CPA approach and use the Maths No Problem books to support their planning and teaching. Powermaths should also be used to support planning and teaching.

The principal focus of mathematics teaching in upper key stage 2 is to ensure that all pupils 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.

At this stage, 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 also consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the 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 also be able to read, spell and pronounce mathematical vocabulary correctly.

Teachers in Years 5 and 6 should continue to employ the CPA approach and use the Maths No Problem books to support their planning and teaching. Powermaths should also be used to support planning and teaching.

Throughout key stages 1 and 2, teachers provide children with 4 different levels of challenge in lessons. It is the aim for children to challenge themselves appropriately through selection of their own challenge level. This is closely monitored by the class teacher and children should aim to reach and achieve within chilli challenge 3 or beyond in line with new National Curriculum expectations:

Chilli challenges 1 and 2	Consolidation of prior stage skills, knowledge and understanding
Chilli challenge 3	Age/ stage related expectations - mastery challenges
Scotch bonnet challenge	Mastery at greater depth / broadening of mathematical skills and understanding

Teaching Calculation

The Grange Primary School follows the formal written methods recommended by the 2014 National Curriculum Expectations (see National Curriculum Appendix). The grid method should be taught as a stepping stone to the more formal column methods. Number lines are also important - children should be taught at all stages how to use number lines to support mental calculation and time. The school has recently purchased documents to support the policy for teaching calculation, available from Autumn Term 2018.

Problem Solving and Reasoning

At The Grange Primary School we embed problem solving and reasoning within our daily teaching. Through the chilli challenges children consolidate prior knowledge, become fluent in their skills and apply them through problem solving tasks. Children are encouraged to reason and challenge their thinking about mathematical concepts.

A wealth of problem solving resources are available in school and it should be embedded in cross curricular teaching. The NCETM progression in problem solving document should be used to support planning.

There should be evidence in pupil books of them accessing mastery and mastery at greater depth challenges at whichever stage they are working.

Differentiation

As previously stated, the expectation is that the majority of children will move through the curriculum at broadly the same pace. More able pupils who grasp concepts are challenged through rich and sophisticated problems in different contexts and across the curriculum and are challenged through peer mentoring. SEN-D children and those who are not sufficiently fluent in earlier material will consolidate their understanding through the chilli challenges in class, same day intervention and appropriate intervention before moving on.

To support differentiation, a WILF should be planned for to achieve the TLC and should be created each lesson with the children and be differentiated as appropriate to the chilli challenge. Task, questioning and support should be appropriate to the needs of all pupils including SEN-D and G&T. A range of questioning should be evident, both open and targeted should be included in planning each lesson. Questioning should encourage thinking and explaining (puzzles and problem solving). VAK teaching strategies should be employed throughout the week to cater for all learning styles.

More able children should be challenged through application to a variety of contexts and across the curriculum and through peer coaching. They need to be broadened. Chilli challenge 3 should enable children to access age related mastery tasks and Scotch Bonnet should enable children to access deeper reasoning and mastery at greater depth challenges. Pre-teaching by the class teacher should take place where applicable to support children in accessing the learning in class and also to challenge the more able pupils.

Children, where it is appropriate, have maths targets set as part of their Personal Passports in conjunction with the SENCo and parents. Details of specific children and interventions are available on the whole school provision mapping document.

Displays and resources in maths

Children of all ages and abilities should be encouraged to use resources to develop and explain their mathematical understanding. Some examples of resources used across the school include: Numicon, Base 10, Counters and Cuisenaire Rods. Such resources support with the concrete representations and understanding of concepts throughout all key stages.

Development of bar modelling supports children with visualising concepts and problems at all ages and stages.

Children should be encouraged to develop their abstract, written representations of mathematical concepts and the calculation policy should be followed to ensure consistency throughout all key stages.

Children in all stages should apply their knowledge and understanding of maths across the curriculum to solve problems.

The maths display should clearly reflect the aspect of maths being taught at that time. A piece of children's work should be on display for children to peer critique. The display should be interactive, creative and used as a working wall. At the end of each topic, the display should be transferred from the working wall display to a floor book/ scrap book for children to use as a continual reference point.

ICT in maths

Children at The Grange Primary have access to a number of online maths resources including MyMaths, Education City, Purple Mash, TT Rockstars, and Sumdog. All such resources are used by pupils and teachers to strengthen fluency and enjoyment of maths.

Assessment in Maths - Foundation Stage

During the first 3 weeks entry into FS2, children are baselined using observations and pre school data.

At the end of their Foundation year, children's progress is recorded on to the Early Years Foundation Stage Profile. Each child's level of development is recorded against the Ages and Stages. Ongoing assessments are made using an online learning profile, Tapestry, in the Foundation Stage. In the Foundation Stage, children are set weekly maths challenges and are rewarded with a rainbow bead for their target string in the classroom. These assessments are regularly shared with parents and support the judgements for the EYFS profile at the end of the year.

In the final term of Reception, the EYFS profile should be completed for each child (June). It assesses the child's readiness for Year 1. The profile must reflect: on-going observation; all relevant records held by the school; discussions with parents/carers and any other adults whom the teacher, parent or carer judges can offer a useful contribution.

Assessment in Maths - Key Stages 1 and 2

At the end of year 2 and year 6, children are assessed against the National Curriculum requirements through SATs. In Year 2 this is to be used alongside teacher assessment to reach a final summative assessment

Teacher assessments are ongoing throughout Key Stages 1 and 2. Assessments are supported by classtrack, hot tasks, testbase and PUMA tests (Rising Stars).

In Key Stages 1 and 2, children work with the teacher to set their own maths targets, using the Assertive Mentoring Files. These files detail the targets for each attainment stage and children are able to identify their own target for development. This target is written onto a post it note or target card and placed into the child's book or on their desk for regular reference. When the child has achieved this target, they receive a rainbow bead for their target string in class and then set a new target.

Homework

In Key Stages 1 and 2, children are expected to complete a piece of maths homework on a weekly basis. Children should also be set weekly times table homework. Online homework is also available to support teachers in providing children with varied and engaging homework tasks appropriate to their stage of learning.

Marking and feedback

Children receive same day marking and feedback. Children are provided with same day intervention to close gaps or to challenge the more able. In addition to flashmarking, feedback for each child should use 2* and a wish regularly and provide children with their next steps and challenge. Evidence of intervention and/or challenge should be in each child's book. Marking should adhere to the school marking and feedback policy.

Subject Representatives

Each class has a maths subject representative in Key Stages 1 and 2. These subject representatives work with the maths leadership team to develop an action plan to improve maths in the school. The actions should be child initiated and led ensuring that pupil voice is central.

Parental Links

Parents are provided with documents to support the teaching of maths at The Grange Primary School. Key information regarding the teaching and learning of maths is available on the school website. Support materials for parents are also available on the school website. Children's teacher assessment results and targets are shared with parents at regular parent meeting days along with pupil passports where applicable.

British Values

The maths curriculum promotes the British Values of tolerance and resilience through problem solving and understanding of complex concepts. Children are required to persevere to solve problems. Teamwork is central to maths through peer assessment, mentoring and group work. Mutual respect is developed as children work together and build confidence in one another. Children can feel safe to make mistakes and take risks in problem solving, thus developing self confidence and esteem. Children are encouraged to become life long learners alongside developing their mathematical skills across the curriculum through enterprising and problem solving.

Monitoring and Review

The subject is monitored in the Autumn Term by the leadership team. Monitoring involves lesson observations, planning and book scrutiny, monitoring of staff non negotiables, pupil interviews and data analysis. A report is produced and submitted to the governors and headteacher. Staff are provided with both general feedback and individual feedback regarding the scrutiny. In the Summer Term, the targets provided to each teacher in the scrutiny are monitored and reviewed. Data analysis takes place each half term throughout the year.

