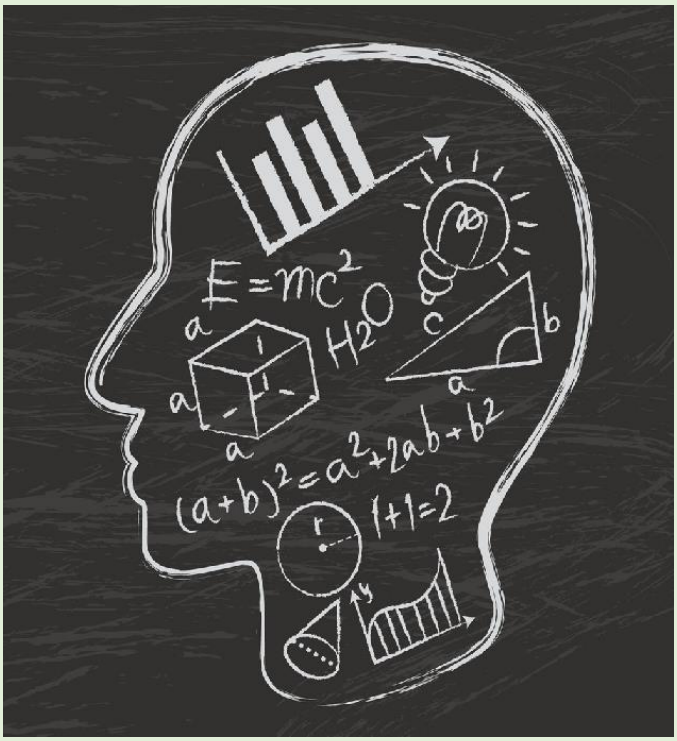
Grange Primary School
Pursuing excellence for every child

Mathematics Policy



Curriculum Intent

The vision and aim of the mathematics curriculum is to develop holistic mathematicians who are fluent with the full range of age-related skills and who can reason mathematically and problem solve robustly; this is made possible by pupils drawing on strong recall of facts and procedures, and on strong conceptual understanding, established through sufficiently challenging and supported opportunities to learn, discuss, question, visualise, manipulate, practise, apply, revisit, strengthen and connect all content taught through the lens of the CPA-S approach – concrete, pictorial and story-telling/context-based experiences are essential in supporting the development of a successful mathematician.

Aspirations

This driver will ensure that pupils are aware of a diverse range of career opportunities and the lifelong learning available to them. This will be achieved through aspirational speakers that visit our school and linking mathematics to the wider world.

Independence

Although collaboration, discussion and support are key components of learning in mathematics, developing independence and self-reliance is necessary to establish robust mathematicians.

By Year 6, a successful mathematician at Grange will:

- Have been instilled with positive attitudes towards mathematics and will express the determination to overcome difficulties.
- Have developed a secure understanding of mathematical concepts, being able to synthesise interpretations from different types of learning which aim to strengthen concrete, pictorial, contextual and abstract representations.
- Be able to mathematically reason explicitly by through discussion, explaining and demonstrating, and reason implicitly by solving problems, using their strong grasp of mathematical vocabulary, conceptual understanding, recall of facts and fluency of skills.
- Be able to mathematically reason and solve problems by following a line of enquiry, working systematically and logically, and by developing arguments and establishing justification or proof.
- Be able to clearly express their thoughts, ideas and arguments having been exposed to mathematical vocabulary and verbal reasoning practice during teaching and discussion.
- Have a secure, fluent, comprehensive and interconnected understanding of the number system in order to recall facts rapidly, including all times tables, count confidently and apply such knowledge in solving problems.
- Have a secure, fluent, comprehensive and interconnected understanding, underpinned by the CPA+S approach, of the prominent areas of measure, fractions, decimals and percentages.
- Have a secure grasp of a variety of a mental, informal and formal calculation methods for all four operations to solve arithmetic-based problems, and to know when it is most suitable to utlilise these methods.
- Be able to identify mathematical relationships within and between different areas of mathematics.
- Have been instilled with an appreciation of how mathematical concepts are relevant to everyday life and thus be able to connect such concepts with appropriate contexts and previously learnt knowledge of the world.
- Have a secure understanding of the areas of maths underpinned by spatial, temporal and pictorial elements, such as shape and time, and be able to interpret statistics in diagrams, charts, graphs and tables.

Implementation (structure, systems, teaching and learning)

To ensure the vision and aim of the mathematics curriculum can be fulfilled, there are four pillars of mathematics that are at the centre of all decisions, reflected in the structures and policy appendices mentioned below.

Four pillars of mathematics

- Fluency and number sense
- Conceptual understanding
- Reasoning
- Problem solving

Yearly and termly structure

- Teachers must follow the units prescribed within the scheme of work (**See Appendix E for LTP overviews**) for their year group in order to achieve full coverage of the statutory content that pupils are required to understand by the end of each academic year. Breadth is as important as depth in mathematics, so time allocations for each unit must be adhered to; within each unit's time allocation, teachers decide in what order outcomes are taught, how long for, how to combine them, and what resources to use, depending on their class; insecure areas can be revisited through starters, through same-day interventions and during the '30 minute weekly challenge'.

- A top-down approach is compulsory in that pupils are taught age-specific content, although pupils will need to constantly build on previous understandings; where appropriate, younger-aged content may be woven within age-related content. The Calculation Policy must be used in synchronisation with the scheme (**See Appendix D**).
- At the end of each unit, the corresponding end-of-unit test must be given to pupils as a measure of attainment, where the scores will be recorded on the appropriate spreadsheet. The scores attained on these tests will be triangulated with termly NFER tests and book work which will help teachers form overall judgements of progress and attainment. The end-of-unit tests are low-stake and are an opportunity for pupils to revisit and recall content; teachers should discuss answers post-test as a learning opportunity for pupils.

Weekly structure

- Five 75 minute-long mathematics lessons a week must be delivered, focusing on appropriately sequenced content outlined in the scheme of work. Within each unit's time allocation, teachers decide in what order outcomes are taught, how long for, how to combine them, and what resources to use, depending on their class.
- One 20-30 minute-long afternoon session a week must focus on the teaching, practice and assessment of times tables, utilising the whole-school system (**See Appendix C for Times Tables System and Progression**). Times tables will also feature in main maths lessons, but when, and how frequently, will be decided by teachers.
- At least 30 minutes a week in any form (i.e. 10mins x 3) must be dedicated to improving number skills outside of normal maths lessons to provide pupils with frequent opportunities to enhance number sense; interactive games, oral rehearsal or very short written tasks at are the disposal of teachers. **Note: if a cohort is heavily engaged with same-day interventions or extra tables practise (such as Y4), this may qualify as improving prioritised skills outside of core lessons.**

Lesson structure **(See Appendix B for Book Presentation Expectations)**

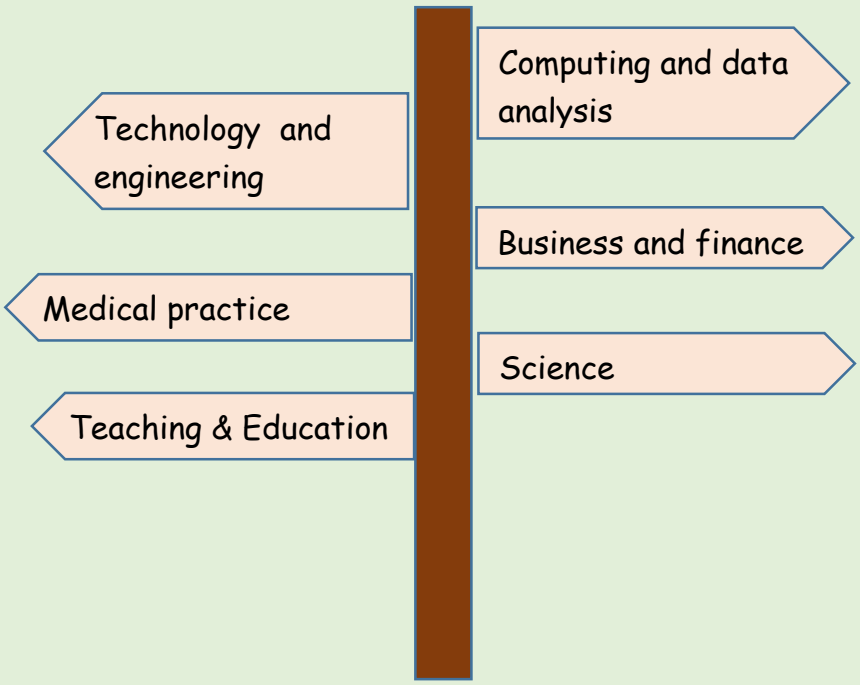
Note 1: Some outcomes may be spread over a few lessons so the structure below may also be spread – it is a guide rather than a prescription.
Note 2: It is expected that most work is evidenced in books. However, much learning takes place outside of the written domain. If lessons are mostly concrete-based and hands-on, ensure photo evidence is taken and stuck in.
Note 3: EYFS may adapt structure to be more age-appropriate but must encourage the teach, practise, apply principles and must encourage high expectations and pace.

1. After children record the date and challenge of the main lesson, they should have a pacey starter to work on straight away while others catch up, which should focus on basic skills such as number sequencing, halving, doubling, recall of number facts, counting through boundaries etc. Afterwards, there may be a continuation of the same starter, or preferably, a concept previously learnt from the main curriculum should be briefly recapped as a second starter, where pupils should answer a few relevant questions as a recall opportunity. Starters in total should last for approximately 15 minutes.
2. Children should then be introduced to the subject matter of the main lesson, where a teaching introduction should aim to explain and model content, drawing on concrete, pictorial and abstract representations appropriately to embed strong conceptual understanding. Questioning should be plentiful and aim to engage pupils, while also being used as a tool to assess understanding.
3. Once content has been taught, pupils should then be given an opportunity to practise in pairs or independently through the use of 'base questions', which can be recorded in books, although this may not always be appropriate. Teachers should then ask pupils to feedback answers, where discussion, modelling and re-teaching may be appropriate, always linking back to conceptual understanding and clear, correct, systematic procedure.
4. Once pupils have been taught successfully, they can then use their sense of confidence, alongside teacher AFL, to engage with and select/accelerate through fluency tasks that should be labelled Gold, Silver or

Bronze, all of which aiming to secure, to varying extents, progression towards achieving the lesson's outcome **(See Appendix A for the Differentiation and Progression chart).**

5. During these main tasks, support and active marking should take place, where verbal feedback/demonstration will be given to correct misconceptions and reinforce correct learning. Sometimes, whole-class, shared-marking may take place, where common successes and misconceptions can be addressed.
6. At some point during the lesson, or within a series of lessons, pupils should be stopped and given a mixture of Ruby-reasoning problems which aim to strengthen implicit and explicit reasoning/problem solving. These types of problems should be discussed and modelled with pupil-input. Whereas more confident pupils may complete more with greater independence, other children may shared-solve and complete fewer, in order to build confidence. Teachers should aim to class-solve problems after attempts have been made so pupils can learn from their successes and mistakes. **Note: problem solving within a lesson is not a test – it is a learning opportunity where discussion and modelling is plentiful. Teachers should create a safe space so all children can try, succeed and learn from errors.**
7. At the end of each lesson, teachers and pupils should engage with a plenary, reflecting on the lesson's outcomes, self/peer assessing if appropriate, connecting to previous and future content, and moving the learning on if necessary.

As competent mathematicians, pupils could aspire to secure careers within these sectors:



Assessment

A combination of formative assessments are used daily such as questioning and active marking to ensure misconceptions are quickly addressed and correct knowledge reinforced; these methods of assessment are also useful for planning and adapting future lessons and same-day interventions to ensure pupils are being supported and challenged appropriately. As well as formative assessments, summative assessments in the form of termly NFER testing and end-of-unit tests provide teachers and leaders with snapshots of attainment that are not just tools of monitoring standards and pupil progress, but are also further tools that inspire actions to close gaps in attainment.

EYFS

The EYFS framework seeks to bridge the transition between this stage of learning and Year 1. EYFS provision draw on guidance set out in the statutory framework alongside 'Birth to Five' and 'Development Matters'. In EYFS, learning kinesthetically, through play and through structured activities are key requisites before pupils are finally expected to begin learning at tables and completing tasks in written formats, ready for the transition to Year 1.

Curriculum Impact

By the end of Year 6, pupils will have developed a secure, fluency grasp of all mathematical knowledge and skills, paired with an ability to reason and problem solve, drawing on robust conceptual understanding and recall. As well as developing mathematical competence, pupils will have developed mathematical appreciation, recognising the important place of maths in everyday life and it's necessity in multiple careers.