

HAGBOURNE C.E. PRIMARY SCHOOL



'Preparing each child for their future in an ever-changing world'

CARE - COURAGE - RESPECT - RESPONSIBILITY

Mathematics Policy (September 2021)

Maths at Hagbourne School

The document below explains what maths at Hagbourne School looks like:

https://docs.google.com/document/d/1v7s_MtK6H13Xf1KzGYrbJPKHdRRWlaJk5kgXtrQLWk/edit?usp=sharing

VISION

Hagbourne Church of England Primary School is inclusive, serving equally those of all faiths or none through the provision of an education of the highest quality within the context of Christian belief and practice.

'Jesus Christ is the same yesterday and today and forever'. From His teachings we get our our key Christian values of Respect, Responsibility, Care and Courage. These provide a stable and caring environment where we are *'preparing each child for their future in an ever- changing world'*.

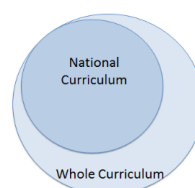
The policy is intrinsically linked with and is informed by other school policies, including:

- Calculation policy
- Assessment policy (including teaching and learning)
- Early Years policy
- Special Educational Needs and Disability (SEND) policy
- Spiritual, Moral, Social and Cultural (SMSC) policy

General approach

As part of our strategy to raise pupil attainment, the school uses 'The national curriculum in England: mathematics programmes of study: key stages 1 and 2 (2013) as a basis for planning teaching and to fulfil the government's statutory requirements; this ensures continuity and progression throughout the school.

Our school embraces the statement: "The school curriculum comprises all learning and other experiences that each school plans for its pupils. The national curriculum forms one part of the school curriculum." (2.2, National Curriculum 2013, Key Stages 1-4)



Assessment for Learning, a focus on investigative and problem solving approaches, plus the

development of mathematical thinking are at the heart of our school's approach. A rigorous and planned commitment to the development of teacher and teaching assistants' subject knowledge complements and strengthens this.

Aims

Our school believes that every child is entitled to a high quality mathematics education, which will provide a foundation for them understanding the world. As a result, they will have an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. It is our belief that our pupils should:

- **become fluent in the fundamentals of mathematics**, so that they:
 - have a well-developed sense of number values
 - know by heart key number facts, e.g. times-tables and related division facts, number bonds – in line with the latest programmes of study
 - apply knowledge of the above to work out connected facts
- **reason mathematically**, so that they:
 - are able to follow a line of enquiry
 - provide generalisations and proof of findings around their investigations
 - are able to justify their thinking, e.g. as to why a particular calculation strategy is the most efficient
- **solve problems by applying their understanding of mathematics**, so that they:
 - encounter a variety of both routine and non-routine problems
 - are able to select specific maths skills and/or operations
 - persevere with a line of enquiry, breaking down increasingly complex problems into a series of smaller steps

Further to this, the school aims to:

- provide a relevant, challenging and enjoyable curriculum for all pupils
- meet the requirements of the new National Curriculum programmes of study
- promote mathematics as an essential element of communication, which allows pupils to describe, illustrate, interpret, predict and explain
- provoke an appreciation of the relationships in mathematics; that mathematics is not an arbitrary collection of disconnected items
- show pupils the fascination of mathematics and promote ways of doing mathematics which harness their imagination, initiative and flexibility of mind
- build pupils' confidence by creating an "I can do this" ethos in the classroom (linked to growth mindset)
- encourage pupils to work systematically and to show a respect for accuracy and meaning
- encourage pupils to work independently and with others
- develop mental imagery
- use practical resources, models and images to support children's understanding of mathematics.

Intent:

At Hagbourne, we have adopted a mastery approach in the learning and teaching of mathematics. This is being embedded across the school. The main aim of such an approach and development of a curriculum model that values 'going deeper' is to ensure that our children develop a secure knowledge of mathematical concepts, as well as acquisition of skills such as reasoning, so that those pupils beginning their education at school can access age-appropriate ideas as detailed in the DfE ['Mathematics guidance: key stages 1 and 2'](#) (2020) publication, and do not see gaps open in their

learning over time. Integral to this is the school's vision for mathematics which, '...rejects the idea that a large proportion of people 'just can't do maths,' [and aligns with the] 'belief that by working hard at maths they can succeed.' *NCETM – 'The Essence of Maths Teaching for Mastery'* (2016)

Despite having developed a mastery approach in the learning and teaching of mathematics, we are aware that some children will have gaps in their pre-requisite knowledge, including 'number novices' who begin school having had fewer opportunities to think mathematically in comparison with some of their 'number expert' peers. Consequently, we aim to provide children with a wide variety of opportunities to engage with the cardinality, comparison and composition of numbers to ten in the Early Years, as well as providing opportunities for them to count to 20 and beyond. It is then intended that our medium-term planning in key stages 1 and 2 extends learning, plus accounts for cases where 'catch-up' is still required. In addition, this planning also involves longer being spent on each topic as mastery is an integral part of the system, which means a broadening of knowledge and skills can take place as part of pupils' learning experiences.

As a result of this approach being taken, it is intended that more whole-class teaching will be evident than before the implementation of the 2014 National Curriculum. Pupils should consequently progress through curriculum content at broadly the same rate, although support/intervention and broader learning opportunities provided can move groups of children on so that they are able to:

- ☐ Grasp concepts and methods, e.g. through more varied use of practical equipment
- ☐ Be challenged through exposure to greater depth in their learning, e.g. through tackling more complex problems in different contexts

Implementation:

The above decisions taken in terms of curriculum design and intended learning/teaching practice are inextricably linked to necessary Continuing Professional Development (CPD) for teaching staff. School leaders ensure a range of CPD is made available, which means that strong consistency in practice is enabled across Years 1-6, whilst colleagues in Early Years are also aware about the mastery agenda and adopt relevant approaches. This supports the effective implementation of our mathematics curriculum offer.

All pupils receive direct teaching every day which is oral, interactive and stimulating. Teaching styles and lesson structure provide opportunities for pupils to consolidate their previous learning, use and apply their knowledge, understanding and skills, pose and ask questions, investigate mathematical ideas, reflect on their own learning and make links with other work.

Our **approach to teaching** is based on four key principles:

- a dedicated mathematics lesson every day
- direct teaching and interactive oral work
- an emphasis on mental calculation and fluency (extra sessions as required including Mastering Number in Reception and Key Stage 1)
- activities differentiated (through a mastery approach) so that all pupils are engaged in mathematics related to a common theme

Each lesson involves direct teaching and questioning of the whole class, groups or individuals. There is an appropriate range of elements in the teaching, namely directing, instructing, demonstrating, explaining and illustrating, questioning and discussing, consolidating, evaluating responses and summarising. Pupils are encouraged to make decisions, communicate their understanding to others and to reason. Teachers aim to create an environment where pupils are

secure and feel confident in being able to take risks in their learning.

Teaching mathematics to a whole key stage requires careful organisation (in line with the White Rose long term overviews). Teachers are responsible for **planning and teaching** all elements of the mathematics curriculum to their pupils. The mathematics subject leader provides support and guidance to all teachers. Teachers plan using Slides and notes. Teachers have access to resources such as Power Maths, Classroom Secrets, NCETM progression, PD resources and prioritisation documents and Maths No Problem to guide planning and teaching where required in line with the White Rose overviews.

Teachers are supported by teaching assistants, whose work is directed by the teacher. In general, their role is to help the pupils they work with derive as much benefit and make as much progress in lessons as possible. They take part in staff development and have regular discussions with teachers about the purpose of activities and the progress that pupils they work with make.

To ensure **continuity and progression**, staff use the agreed Calculations Policy to ensure that progression is followed at each stage.

All pupils are **included** in the daily mathematics lessons. Teachers plan activities, which are differentiated (meeting the needs of all children including those with SEN and the more able, gifted and talented in line with a mastery approach) around a single mathematical theme. Where needed, children receive immediate intervention to enable them to 'keep up' with the next day's lesson. In lessons, it is common for **differentiation** to appear in subtle forms. Practise and consolidation play a central role in pupils' learning experiences. Although the 'pace' in lessons may appear to be slow, this can mask development of deep understanding of mathematical concepts through use of small steps that encourage connections (for example, in derived number facts) to be made. Further challenge is provided to all children through use of problem solving, including those linked with real-life contexts.

In terms of **assessment**, and so the mastery approach can work, we understand the need for pupils to achieve key objectives for their current stage of learning. Such assessment links with day-to-day Assessment for Learning, which informs teachers about the elements of learning children need to develop further. In lessons, teachers use precise questioning to check conceptual and procedural knowledge. They formatively assess how misconceptions can be used as growth points in learning, whilst also diagnosing who requires intervention, meaning that all children are expected to 'keep up' rather than 'catch-up.' Assessment gathering is kept meaningful and is viewed as a diagnostic tool whereby collated information is used purposefully when planning pupils' next-steps.

Through pupils' learning experiences, teachers **promote connections** within and across key stage 1 and 2 National Curriculum domains, so that children are taken deeper with their understanding over time and recognise the interconnectedness of concepts. Pupils revisit concepts, for example, multiplication within area when presented as an array model, which means they absorb learning within their long-term memory. To secure firm foundations in early mathematics learning, those children in Early Years benefit from daily adult directed teaching experiences, which are then supplemented through opportunities to further engage because of child-initiated learning.

It should be noted that varied use of practical resources, structures and representations, working walls plus questioning that requires deeper reasoning is used to ensure all children are

supported/challenged appropriately. A progression in key representations and structures, leading to understanding of sometimes complex and abstract concepts, is exemplified in the school's calculation policy. This in turn supports the delivery of consistent approaches and equity of access for learners.

The attainment and progress of pupils' learning is tracked by class teachers and senior leaders so that swift interventions can be put into place, including for children who have not always experienced a mastery approach in mathematics over time, and may include the use of pre-teaching, overlearning 'keep up not catch up' intervention or a bespoke designed/adapted intervention.

Impact:

In cases where children's learning is most effectively being deepened, the following descriptors can be seen in their learning:

<p><u>Depth:</u></p> <ul style="list-style-type: none"> ● describe it in his or her own words ● represent it in a variety of ways (e.g. using concrete materials, pictures and symbols - the CPA approach); ● explain it to someone else; ● make up his or her own examples (and non-examples of it); ● see connections between it and other facts or ideas; ● recognise it in new situations and contexts; ● make use of it in various ways, including in new situations. 	<p><u>Greater Depth:</u></p> <ul style="list-style-type: none"> ● solve problems of greater complexity (i.e. where the approach is not immediately obvious), demonstrating creativity and imagination; ● independently explore and investigate mathematical contexts and structures, communicate results clearly and systematically explain and generalise the mathematics. <p><i>NCETM – ‘Teaching for Mastery: Questions, tasks and activities to support assessment’ (2015)</i></p>
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The school's Marking and Feedback policy allows children's levels of independence to be evident, as instances where pupils have the most secure knowledge and skills can most easily be recognised when they've applied learning independently and in a range of ways, including across different areas of the curriculum. On occasions when such extended depth has yet to be developed, an expected impact of our curriculum offer is that children are at least ready to move on to the next key stage of learning. This can be judged by each pupil's capacity to access age appropriate ready-to-progress criteria in Years 1-6 as detailed in the '*Mathematics guidance: key stages 1 and 2*' publication. In Reception, we implement the latest Early Years Framework, which became statutory in September, 2021, and the impact of our increasing emphasis on progressive learning is that increasing proportions of children secure understanding of all concepts and skills detailed in progression charts related to the [six key areas of early mathematics learning](#). This is expected to further impact by in turn allowing them to attain the Early Learning Goals (ELGs) for mathematics.

Taking into account ACME's, '[Professional learning for all teachers of mathematics](#)' (2016) report, whereby it is stated, 'highly-effective teachers of mathematics have a positive disposition towards the subject and are comfortable in exploring mathematical ideas with their learners,' the most effective CPD experiences result in this being a key impact on our teaching staff.

Leadership and Management Roles

The Headteacher and mathematics subject leader are responsible for supporting the development of effective teaching across the school.

The main roles are to:

- ensure that teachers are confident with the new National Curriculum and help them plan lessons
 - lead by example in the way they teach
 - prepare, organise and lead training/CPD with the support of the headteacher
 - support the headteacher in carrying out an audit and agreeing an action plan with staff and the governing body
 - work cooperatively with the SEND coordinator in providing advice and support to staff
 - observe colleagues with a view to identifying the support they need
 - attend training to broaden their knowledge of mathematics and mathematics teaching
 - make reports to the governor responsible for maths on the school's progress
 - lead, manage and monitor the implementation of the National Curriculum and a mastery approach including monitoring teachers' planning and the quality of teaching in classrooms
 - agree an action plan for achieving the school's targets with the whole staff and governing body

The full governing body retains responsibility for raising standards in mathematics; the role of the mathematics governor is to raise the profile of the subject and to be a source of support and a critical friend to the school.

The governor's role is to:

- attend some training
- meet with the headteacher and maths subject leader to discuss the school's progress and future plans in implementing the New National Curriculum
- hold discussions with teachers and observe some teaching at each key stage with the headteacher or the subject leader
- produce and agree a section for the annual governors' report about mathematics
- work with the school to inform parents about, and involve them in, their children's mathematics.

Monitoring and Evaluation

Plans are in place for regular monitoring of the work of the school and to evaluate the effectiveness of teaching and learning in raising standards. These judgements take into account the pupils' ability on entry and their relative progress across stages.

Annual action plans will take the above into account. Monitoring focuses on those aspects of our work which have direct relevance to pupils and their learning, namely:

- what the pupils are learning
- their attitudes to learning
- the standards they attain and progress they make
- the quality of our planning and teaching.

Evaluation of this information informs strategic planning. Monitoring takes place across the whole

school on an annual basis. This involves;

- looking at pupils' work
- talking with a sample group of pupils
- observing lessons
- looking at teachers' planning
- discussing with staff, pupils, parents and the governing body
- analysing a range of data and records (e.g. assessments and test results).

Summaries are written and discussed with staff. This information feeds into the School Development Plan.

Review

This policy will be reviewed annually in line with the school's policy review programme. The subject leader is responsible for reporting to the governors about the quality of its implementation and its impact on standards. In the light of this, policy amendments may be made.

Last reviewed: September 2022

Next review: September 2023

Signed: _____

(Chair of Governors)