MATHEMATICS POLICY

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Introduction

At Hill Farm, we believe that every child should be excited by and talk passionately about Maths. The skills gained here will enable children to grow and develop into critical thinkers and problem solvers. We have adopted a mastery approach to the learning and teaching of mathematics to nurture well-rounded mathematicians. Mathematics in our school is enhanced by individual classroom environments, which are teeming with rich vocabulary and supportive models, through our Times Table Rockstar competitions as well as our collaborations with external organisations where children participate in games and competitions.

The school's aims are to:

• Deliver a rich and engaging mathematical curriculum, which supports the development of children's fluency, reasoning and problem-solving skills, in line with the National Curriculum 2014;

• To introduce new mathematical concepts using the concrete, pictorial, abstract (CPA) approach to learning where new skills are modelled with accessible apparatus, visual prompts and high quality resources;

• Use a child-led approach whereby pupils can take ownership of their learning and choose their own level of challenge. To encourage children to work collaboratively, prompting mathematical talk and developing rich vocabulary;

• Practice mental arithmetic daily using cross-curricular and real life links;

• Ensure problem solving is at the heart of every lesson to apply the children's knowledge of new skills and develop them into critical thinkers;

• To thread key values such as determination, cooperation and resilience throughout every Maths lesson, enabling children to feel confident enough to challenge themselves and learn from their mistakes

The National Curriculum aims in Maths are to ensure that all pupils:

• 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.

Objectives

As a school, we have adopted to follow the White Rose Scheme of Learning. This curriculum is delivered across blocks of learning each with progressive steps. This ensures that each unit is covered in depth to achieve conceptual understanding as well as providing further opportunities for pupils to apply their skills across a variety of problem-solving activities. The curriculum is also cumulative so that once a topic is covered it is met many times again in different contexts to embed and deepen understanding. Access to the Schemes of Learning can be found at https://whiteroseeducation.com/

Reception

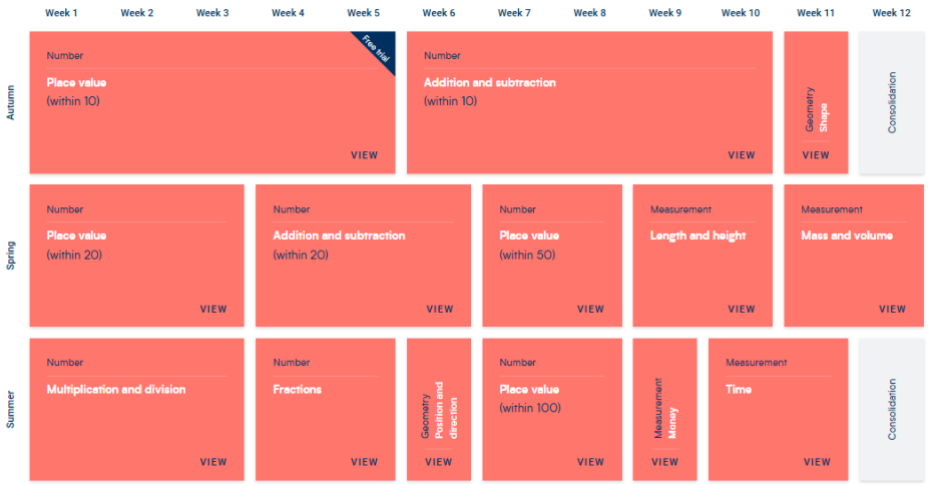
In EYFS, the White Rose scheme supports specific teaching through small steps with adult-led activities and continuous provision. The focus is on building up the numbers slowly, so children gain a deep understanding of them and how they are composed. However, this does not mean children should not be counting and discussing larger numbers in routines such as lining up. Children are supported in gaining an understanding of, the counting principles. 1. The one-to-one principle. 2. The stable-order principle. 3. The cardinal principle. 4. The abstraction principle. 5. The order-irrelevance principle. It allows for key mathematical concepts to be revisited and developed throughout the year.



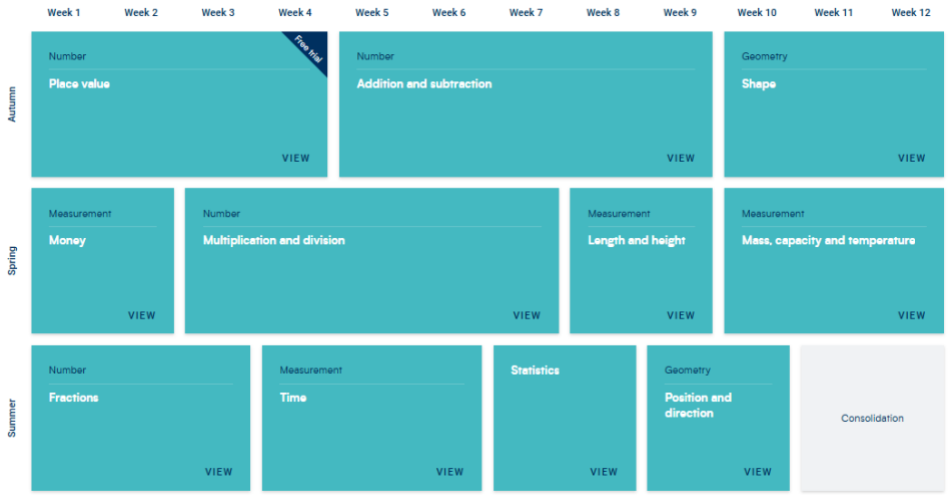
Key Stage 1

Throughout Year 1 and Year 2, pupils will be taught about whole numbers, counting and place value, working with numbers up to 100. Pupils should begin to develop their confidence and mental fluency, using practical resources to support their understanding. They will be taught to apply numbers up to 100 across the four operations and through different measures including length, mass, capacity/volume, time and money. Pupils will develop their ability to recognise, describe, draw, compare and sort different shapes. By the end of year 2, pupils should know and be fluent with their number bonds to 20.

Year 1



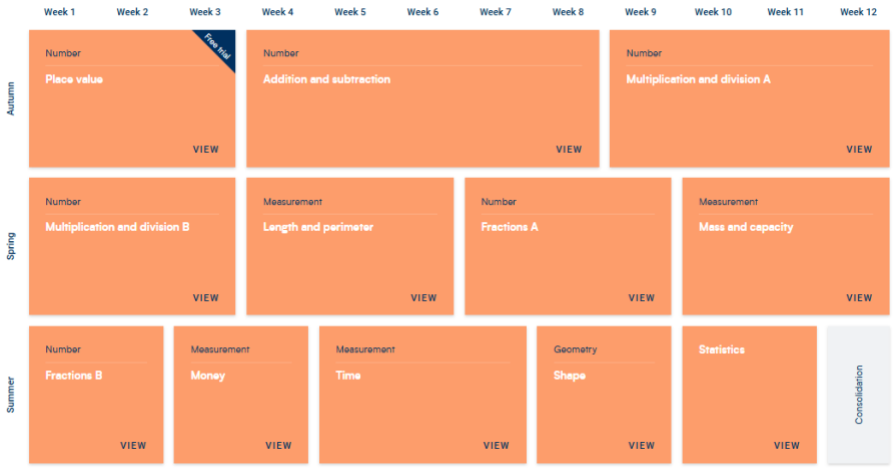
Year 2



Lower Key Stage 2

Across Year 3 and Year 4, pupils will become increasingly fluent with whole numbers up to and including 1000, applying them across all four calculations and including the concept of the place holder. When secure with this number fluency, pupils will develop efficient written and mental methods, performing calculations accurately across a range of problems including those with simple fractions and decimals. Pupils will be taught to analyse shapes and their properties, and confidently describe the relationships between them. They will learn to 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 times tables showing readiness for the National Multiplication Checks.

Year 3



Year 4



Upper Key Stage 2

Across Year 5 and Year 6 pupils will extending their understanding of the number system and place value to include larger integers up to 10 million in year 6. Children will be taught to make connections between multiplication and division with fractions, decimals, percentages and ratio. With this confidence in number, pupils will be developing their ability to solve a wider range of problems, using their efficient written and mental methods of calculation. In year 6, pupils are introduced to the language of algebra as a means for solving a variety of problems. In geometry, pupils will classify shapes with increasingly

complex geometric properties and they will 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.

Year 5



Year 6



Planning and Evaluation

The long term plan set out by White Rose is followed in every year group to ensure efficient coverage and skills progression. At Hill Farm, teachers use the White Rose scheme to map out their steps, unit by unit, adapting the time spent on each step in order to meet the needs of the children. This allows teachers to develop a bespoke curriculum for their classes. Using the small steps of learning from each block, teachers plan their lessons, ensuring they include engaging activities, which are differentiated to meet the needs of all learners. Each lesson includes mental arithmetic to aid fluency skills and new concepts are taught using the CPA approach. The formal written methods taught at each key stage are progressive and can be found in our calculation policy. Across each small step, every child will be challenged appropriately and will apply their new conceptual understanding across varied reasoning and problem-solving opportunities. Accurate pitch and quality of lessons are regularly monitored by the subject leader. In each year group, children have additional timetabled maths meetings. From Reception to Year 2, Mastering Number is taught 3 / 4 times a week. This project aims to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2. The aim over time is that children will leave KS1 with fluency in calculation and a confidence and flexibility with number. In Year 3, these sessions are used to secure and build upon number facts taught in Key Stage 2. Year 4 and 5 continue to build on their fluency skills to develop efficient and effective quick recall skills, applying known facts to solve related calculations. The aim over time is that all children will leave KS2 with fluency in multiplication and division facts, and a confidence and flexibility with number that exemplifies good number sense when looking at the multiplicative relationship. In Year 6, teachers plan bespoke arithmetic sessions to meet the needs of their cohort, based on assessment outcomes. All children have access to Numbots and Times Tables Rock Stars to further develop number and multiplication skills. Morning maths work is also set where children access mathsbot. Children are identified for pre teaching activities, where they can access White Rose Infinity tasks in order to prepare them for up coming learning.

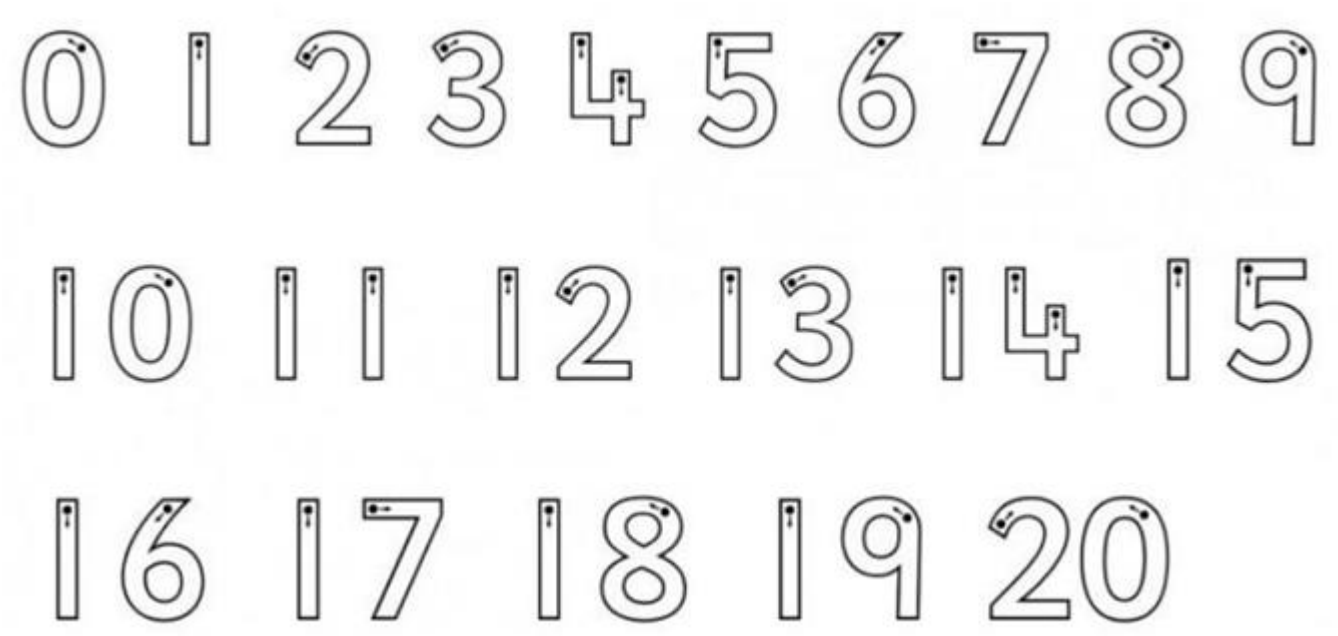
Assessment

Assessment for each new objective taught is ongoing and assessed by the class teacher. Within each lesson, pupils` understanding is checked through observations, questioning and discussion as well as any written outcomes produced. The teacher offers regular verbal and written feedback to each child so pupils are aware of their individual targets. Misconceptions are addressed and pupils are given the opportunity to reflect and respond to these. The teacher also uses feedback as an opportunity to challenge children further by providing questions that expand thinking. As well as this, summative assessment is carried out at the end of a unit as well as the end of each term. These assessments are

provided by, and therefore in line with, the White Rose schemes of learning. Formal end of term assessments are designed and produced to reflect SATS assessments and include an arithmetic paper as well as a reasoning and problem solving paper. Teachers are able to use these assessments to support their teacher judgements and the pupils` overall attainment and progress can be reported on and shared with parents/carers. These judgements are supported by ongoing moderation, both across school as well as across consortium schools.

Number formation

It is essential to ensure consistency of number presentation throughout the school and avoid ambiguity between which number is which. Children will begin to explore number formation in the Foundation stage through mark making but the formal teaching of writing numbers will begin in Year 1 and continue throughout the school. Correct modelling of number formation from all adults in school is expected. The correct models of formation should be displayed, in a large format, in every classroom and learning space. Agreed display materials will be used in all classrooms. The number formations below should be used:



If the formation of numbers is found to be incorrect, this will be identified in live marking. Dotted formations to trace may be used to support this as needed. Additional support on number formation in KS1 and KS2 can be supplemental to handwriting practice or as part of individual support programs.

Whilst this is the way children and adults at Hill Farm Primary School will write numbers, it is important that children recognise different forms of the numbers in print since they will encounter them in everyday life. Number recognition should be covered as part of the day-to-day coverage of the mathematics curriculum throughout school. Additional support on number formation in KS1 and KS2 can be supplemental to handwriting practice or as part of individual support programs.

When recording mathematical learning, the children should (wherever possible) use the squares in their books to write out calculations and answers. This enables them to regularly practise the correct number formation and layout of calculations. When recording in maths, the children will use squared paper, where each digit or symbol is written in one square. Teachers will model and enforce this when teaching maths throughout the key stages.