

Maths

INTENT - to what do we aspire for our children?

'Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.'

Source: National Curriculum (updated Jan 2021).

At HPPS maths develops the school's 4 key drivers in the following ways:

Excellence

- Teachers model being proud of their successes with their maths learning, both presentation and content
- Children are able to articulate their successes and progress as young mathematicians
- Our maths curriculum is a spiral curriculum where key concepts are introduced, revisited and deepened over time
- Sequencing of teaching and rehearsal, including spaced retrieval practise, allows children time to commit concepts, rules and principles to store in their long-term memory
- Children's learning is developed through the Concrete-Pictorial-Abstract (CPA) approach in order to build on their existing understanding and to develop their conceptual understanding
- Mathematical thinking is developed and scaffolded with sentence stems both in oracy and writing. Vocabulary is used deliberately and intentionally
- Mathematical fluency is built and sustained overtime

Equity

- We introduce children to a diverse range of famous mathematicians and highlight the importance of maths in the real world
- Scaffolding supports all learners- we use a small steps approach, deepening the concept over the lesson
- All children have the opportunity to reason on a regular basis
- Responsive teaching and deliberate use of feedback moves learning on for all pupils

Character

- We encourage children to collaborate within maths and share their processes with talk partners and as a whole class. Children will listen respectfully to others and be thoughtful in their responses
- Children take pride in their maths learning and presentation
- Children take on board feedback to understand where they have been successful and what they need to do next to improve

Community

- Children's learning is celebrated at school and at home
- We encourage participation in the school community through low stakes maths challenges
- Maths is linked to local real world contexts with 'a minute of me' in Praise.

Aims of the Maths Curriculum

In line with the 2014 National Curriculum, our curriculum for mathematics aims to ensure that all pupils:

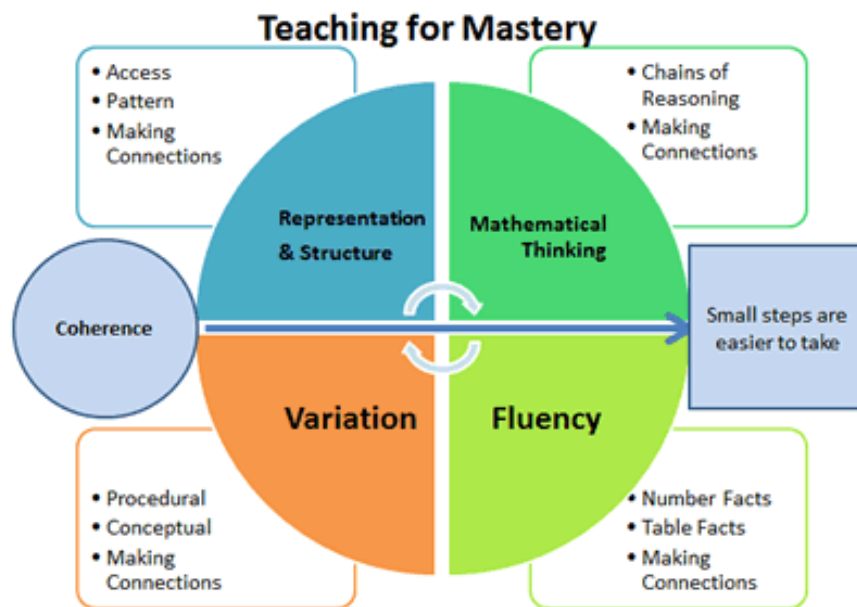
- think and behave like mathematicians, rather than just 'do' maths
- become fluent in the fundamentals of mathematics, including through varied and frequent practise with increasingly complex problems, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly 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.
- understand the practical advantages of mathematics and its purpose in the real world

- develop a positive attitude towards mathematics and demonstrate resilience in their learning

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The key ideas central to our approach are:

- The Teaching for Mastery approach and the [5 Big Ideas for Mastery](#) - fluency, representation and structure, mathematical thinking, variation and coherence. These will be evident in all lessons.
- Lessons provide access for all children to succeed and master concepts.
- Lessons provide an opportunity for reasoning and discussing methods and strategies.
- We expect and encourage children to use mathematical language to describe, discuss, examine, explain, justify and synthesise.



Long Term Sequence

The long term sequence followed by Year 1-6 follows a spiral curriculum with the intent that this allows for depth and breadth of learning within mathematical concepts while also ensuring these concepts are revisited, applied and connected throughout the year. The schemes of learning can be found on [White Rose Maths \(WRM\) Scheme of Learning](#). A weekly overview of coverage can be found [here](#).

Assessment

- Standardised assessments: EYFS Baseline, KS1 & KS2 SATs, Multiplication Tables Check
- Formative assessment is ongoing during lessons and across units of work. Using the CEEAAC model (below), teachers are responsive to the needs of their class and use hinge questions and flexible working groups.
- PiXL assessments and QLAs are used to identify gaps in learning and directly inform planning and if necessary, intervention.
- Rapid recall of multiplication and division facts are assessed through daily practise
- EYFS and KS1 are assessed daily on their number facts calculation strategies

IMPLEMENTATION - how will we deliver the curriculum?

Linking curriculum and pedagogy

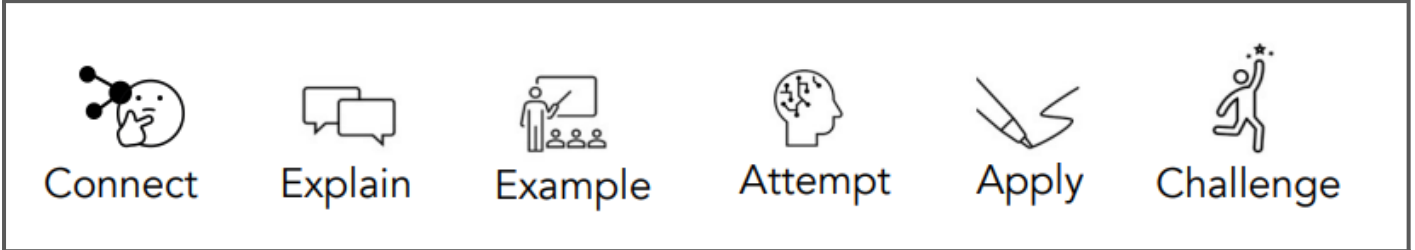
Across a unit, the learning is generally built up in the following way:

- Key learning is broken down into small steps which are sequential and build upon each other
- CPA approach is integrated within each of these small steps so that children are able to develop a conceptual

understanding and build upon their fluency and problem solving and reasoning skills

- Mathematical talk is used as a scaffold across the unit
- Vocabulary is introduced and revisited throughout the unit
- Children are exposed to varied representation across the unit

Lesson Design: Core components



Each lesson follows the model above.

- CONNECT to prior knowledge
- EXPLAIN new content, element of working scientifically and scientific vocabulary
- give and EXAMPLE of new learning
- Pupils ATTEMPT new learning with scaffolding
- APPLY new learning independently
- Pupils are CHALLENGED to integrate learning with prior knowledge

Maths Lessons

All children are taught maths daily. In EYFS, we follow the statutory framework for the early years foundation stage of which maths is a specific area of development. From Year 1-6, Lessons follow the sequences of learning set by White Rose. These lessons follow the CUSP lesson structure used in the wider curriculum at Headley Park: the CEEAAC model. Examples of how lessons are structured can be found [here](#). This structure is designed to ensure all lessons include opportunities to retrieve and connect learning from the long-term memory to the working memory. It also gives children across the school equity of experience. Children in EYFS follow a similar but age-appropriate model.

Number Sense

Children in Year 1 to Year 3 complete daily Number Sense sessions. 15 minute lessons teach a defined set of addition and subtraction facts and a defined set of calculation strategies. The systematic and structured approach ensures children develop key visual pathways and learn important number relationships. This leads to a deep understanding of number and number relationships, and to fluency in addition and subtraction facts. Currently, children in Reception are trialling the new EYFS Number Sense Programme prior to its wider release. Number Sense guidance can be found [here](#).

Times tables

Children in Year 4 – 6 complete times table practise daily. Times tables are taught systematically following the [Ashley Down Times Table Scheme](#). The idea behind this scheme is that the children learn about commutativity, using oral language patterns which begin with the biggest number, e.g. $9 \times 2 = 18$. This means that when they learn their 9 times tables, they will have already learnt this fact along with many others, resulting in them only needing to learn $9 \times 9 = 81$.

The table below demonstrates that only 36 facts are needed to learn up to 9×9 .

36 facts to take us up to 9×9 – Building block facts

Year 3	Year 3	Year 3	Year 4	Year 4	Year 4	Year 4	Year 4
2x	5x	3x	4x	6x	7x	8x	9x
2x2							
3x2	3x5	3x3					
4x2	4x5	4x3	4x4				
5x2	5x5						
6x2	6x5	6x3	6x4	6x6			
7x2	7x5	7x3	7x4	7x6	7x7		
8x2	8x5	8x3	8x4	8x6	8x7	8x8	
9x2	9x5	9x3	9x4	9x6	9x7	9x8	9x9
8 facts	7 facts	6 facts	5 facts	4 facts	3 facts	2 facts	1 fact

A 'Times Table Fact of the Day' is introduced daily before the maths lesson.

After all multiplication facts for this times table have been taught, the children complete a times table test booklet related to multiplication facts they have been learning. One test is completed after morning registration and one test is done following afternoon registration. Two minutes are allocated to each of these tests and they are marked with the children.

These elements make up the following provision in each year group:

EYFS

- 30 mins daily whole class maths lesson, including Number Sense.

Years 1 and 2

- 15-minute daily Number Sense session.
- A daily maths lesson
**Number Sense cannot be tied in with WRM as it works at a slower pace to ensure fluency is achieved.*

Year 3

- 15-minute daily Number Sense* session in addition to the lesson (45 mins).
Number Sense programme will likely run until January, thereafter it will be replaced with a 15-minute fluency session (10 minutes times table booklets plus 5 minutes fluency). Times tables need to be rehearsed twice daily using the booklets. Second daily session will be at the afternoon register.

Years 4, 5 and 6

- A daily one hour Maths session which includes a 5-minute daily times tables starter (using the times tables booklets).
- Times tables need to be rehearsed twice daily using the booklets. Second daily session will be at the afternoon register.

SEND

The curriculum at HPPS is inherently designed to support pupils with SEND through universal quality first teaching. This includes:

- High expectations and aspirations for all learners
- A carefully structured and sequenced curriculum
- Modelling and demonstration
- Chunked instructions which are supported by visuals and gestures
- The use of manipulatives as part of the CPA approach.
- Review, recall, repetition and retrieval
- Frequent formative understanding as teachers check for understanding
- Accurate and regular feedback

However, we recognise some pupils need 'additional to' in order to reach their potential as mathematicians. This includes:

- Carefully considered scaffolding
- Pre and post-teaching
- Pre-planned management of cognitive load
- Explicit instruction and modelling
- Structured challenge, without ceilings
- Additional targeted adult support

In some instances, specialist adaptations are made to support the specific barriers of individual pupils. For instance, where children are working significantly out of their chronological year group, a personalised curriculum may be in place.

COVID response

At Headley Park, we continue to follow the White Rose Maths progression of learning which has interwoven the previous year groups' summer learning to ensure children are fully equipped with the skills to access the curriculum for their year group. Since the Covid-19 pandemic, the White Rose progression documents have been updated accordingly: to enable key teaching points to be highlighted, essential content that the children may have forgotten to be recapped and to flag any content that might not have been covered during the school closures period.. The updated schemes of learning can be accessed on

<https://whiterosemaths.com/primary-sols/>

National Tutoring Programme

From September 2022, funding for The National Tutoring Programme was allocated to Pupil Premium and disadvantaged children. This included 13 children accessing 1:1 maths tutoring in Year 5 and 6 via Action Tutoring and an additional 37 children accessed small group tuition in Year 3 and 4. This support was in addition to the quality first teaching they access with their class teacher.

This programme of support will enable any gaps to be filled and support pupils to make accelerated progress. In the academic year 2022 - 23, 10 years 5 and 6 will continue to receive weekly tuition via Action Tutoring.

We **enrich the curriculum** with:

- opportunities to explore significant and diverse maths individuals. This includes members of the local community in 'one minute of me' in Praise Assembly.
- Maths Challenges at home (linked to Times Table Rockstars)
- Opportunities to experience maths in the real world
- Maths Literature
- Maths and women

IMPACT - how do we know our curriculum is effective?

Pupil Voice

- 'I like maths. Sometimes I use things like cubes and dienes to help me but sometimes, I don't need them. I can use column addition and methods like that'.
- Children receiving additional tutoring say they enjoy their sessions and look forward to their next 'learning group'.
- In Pupil Book Studies, some children are able to explain how they know what they have done well and what they need to do next in order to improve. Some children can explain how same day interventions help them.

High quality outcomes:

- In 2021-22, 81% of children achieved the expected standard at the end of Key Stage Two. Of this 81%, 19% of children achieved greater depth within the expected standard.
- In 2021-22. 62% of children achieved the expected standard at the end of Key Stage One. Of this 62%, 10% of children achieved greater depth within the expected standard.
- Assessments prioritise quality first teaching for all children through Question Level Analysis (QLA) and Pupil Progress meetings. Teachers know where cohorts and individual pupils have gaps in knowledge and understand how to target these areas of learning.
- QLAs show that pupils are secure in the content they have been taught. For example, place value is a strength across the school.
- Pupils are increasingly able to use accurate mathematical vocabulary to articulate their learning in Pupil Book Studies.

Monitoring

External monitoring visit (Oct '21) with a maths focus. Headlines included:

- 'The head teacher, new in 2020, has acted promptly and holistically in his approach to improvements.'
- 'The early years leader has absolute clarity around the curriculum in the setting and its future development. The current pupils in Year 1, were part of an 'early adopter' curriculum. Their end of year assessments showed they had deeper knowledge of number and number patterns than has historically been the case. They were therefore well-prepared for Year 1'
- 'In one of the Year 6 classes there was a model of exceptionally strong inclusion. A pupil with an EHCP was coping with four-digit subtraction. His teaching assistant did not stay by him but helped a number of other pupils. However, when asked she was clear about his next target and knowledgeable about what he knew and did not know. The class teaching assistant held the attention of a relatively large group of pupils with clear modelling and questioning. There was seamless teamwork between the members of staff.'