

Maths

INTENT – To what do we aspire for our children?

-Vision -Design -Aspirations for our curriculum

Our Vision

‘We are a Family of Friends who LEARN together.’

Our Goal

Our vision for excellence within our maths curriculum is created in line with the National Curriculum Programme of Study and ensures 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.



Our intention is to:

- engage, inspire, motivate, support and challenge
- ensure our learners progress academically and become more expert as they progress through the curriculum
- develop successful, informed, engaged, thoughtful, confident learners, who make a positive contribution to the community and society – both now and in the future.

Our Values & Curriculum Drivers






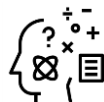


At Hove Learning Federation, history is driven by the following values:

	Love of Learning	<ul style="list-style-type: none"> ● Staff will always model a passion for maths to inspire and enthuse the children to develop a love of the subject. ● Planning uses a creative, cross-curricular approach, including whole school maths days. ● Our lesson design model builds on previous learning and encourages self-belief, curiosity, excitement and motivation, with a focus on building connections and making learning worthwhile and relevant. ● Mathematical reasoning is woven into every lesson and pupils are given opportunities to work with challenge partners.
	Equality, Diversity & Inclusion	<ul style="list-style-type: none"> ● Learning is scaffolded for all through - use of manipulatives, dual coded vocabulary, pre-teaching, stem sentences and guided group work. ● Use of high quality materials and tasks to support learning are integrated into lessons. These may include visual images and concrete resources. ● Children are encouraged to reflect on their own learning styles using the school’s learning characters. ● Children collaborate with their talk partners/challenge partners or in larger groups. ● Children are encouraged to take risks and learn from their mistakes.
	Aiming High	<ul style="list-style-type: none"> ● Speaking and listening skills and core mathematical vocabulary are explicitly taught. ● A range of opportunities are provided, both planned and incidental, for children to revisit, apply and extend speaking and listening skills. ● Interactive teaching strategies are used to engage all pupils in order to develop effective communication skills. ● Mathematical vocabulary is supported in Reception and KS1 with the use of Makaton signs, hand gestures and dual coded symbols. ● Key questions are planned to challenge thinking and develop learning for all pupils.

		<ul style="list-style-type: none"> Children are required to prove their answers and explain their reasoning. Characters and visual prompts are used to support younger children with this. Contexts and representations are carefully chosen to develop reasoning skills and to help pupil's link concrete ideas to abstract mathematical concepts.
	Respect and Well-being	<ul style="list-style-type: none"> Our pupils have opportunities to develop their resilience and confidence in mathematical learning through investigations and maths games. Pre-teaching and well-chosen challenge partners are used to support maths anxiety. Staff model positive language through constructive feedback and praise pupils working respectfully together. Pupils use sentence stems to respectfully challenge ideas such as "I disagree with ___ because..."
	Nurture and Citizenship	<ul style="list-style-type: none"> Maths is linked to real-life where appropriate, to develop future life skills and give the learning context.






Our Curriculum Design

Meet the needs of every child across the whole curriculum









Equity	Inclusion	Learning Behaviours	Personal Development	Skills	Knowledge and Understanding	Creative and critical thinking	Cultural Capital
							
Equality of opportunity. All children to succeed no matter their entry point.	Every child, whatever their individual abilities or needs, is equally valued.	Attitudes and attributes for learning and life.	Equip children to become global citizens, who live happy and healthy lives and know how to achieve their goals.	Curriculum mapped to include the subject specific skills required to attain and excel. Children develop learning to learn skills such as metacognition.	Deep learning of the key concepts of our curriculum and the National Curriculum.	Both are nurtured. Children are challenged to question, reason and express themselves.	Is a golden thread, woven through everything we do to teach children well.

Learning Characteristics Animals

Underpinning Hove Learning Federation's curriculum are our learning characteristic's animals.

Independence	Perseverance	Curiosity	Imagination	Co-operation
				

Maths Long Term Sequence Features

Sequencing 	Small Steps 	Spiral 	Long Term Memory 	Making New Links 	Cognitive Load 	Key Concepts 	Substantive and Disciplinary Knowledge 
<p>Our curriculum design deliberately sequences units of learning from EYFS to Year 6 to ensure children deepen their mathematical understanding through exposure to a progression of substantive and disciplinary knowledge.</p>	<p>Learning is chunked into small steps that allow children to build knowledge and deepen understanding lesson to lesson, unit to unit and year to year.</p>	<p>The spiral design of our curriculum means children will return to key learning points and concepts. For example, the Part Whole model is introduced in EYFS and developed in KS1 to support knowledge of number bonds to 100. By the end of KS2 pupils use the same model to explore parts and wholes with decimals.</p>	<p>The progression of knowledge in maths has been clearly mapped across each year group to ensure children will transfer new learning to long term memory. The ultimate goal is to make the learning stick!</p>	<p>The acquisition of knowledge into long term memory means that children are able to make links with new learning more easily. Our curriculum overview shows how new learning is carefully imparted over time.</p>	<p>Our long-term sequence for maths reduces cognitive load by mapping out opportunities for children to review previous years and units learning. All staff are aware of the units and lessons covered in previous years in order to refer back.</p>	<p>Children develop knowledge about key concepts through our CPA (concrete, pictorial, abstract) approach.</p>	<p><u>Substantive Knowledge</u> The subject knowledge and explicit vocabulary used to learn about the content.</p> <p><u>Disciplinary Knowledge</u> The knowledge about how mathematicians investigate, explore and reason.</p>

Purpose of the Sequence Progression

All children are supported to develop and improve their mathematical skills. We follow the EYFS Statutory Framework (Development Matters) and the Key Stage 1 and Key Stage 2 National Curriculum to ensure that children have the necessary mathematical understanding that will underpin future learning

Why do we have a long-term sequence? What is its purpose?

- There is a coherent and comprehensive conceptual pathway through the mathematics.
- Learning is broken down into small, connected steps, building from what pupils already know.
- Difficult points and potential misconceptions are identified in advance and strategies to address them planned.
- Our spiral curriculum is designed on the principles of instruction and is influenced by our understanding of how the memory works and cognitive load theory.
- Research shows that this will ensure knowledge is transferred to long term memory and making links with new learning is more accessible.

EYFS:

Mastering Number forms the basis of our learning in Early Years. Through daily whole class teaching with an emphasis on modelling language, gestures and representations pupils develop number sense, confidence and flexibility with number. Guided teaching activities deepen pupils' understanding and teachers expertly guide, scaffold and stretch learners. A stimulating learning environment with well-chosen high quality resources enable children to continue to develop their understanding independently.

KS1/KS2:

Learning is carefully sequenced following the National Curriculum objectives for each year group. Learning is broken down into small steps and lessons offer opportunities to revisit and connect to prior learning through the lesson design.

**HLF Long Term Plan
Example**

Our curriculum starts in EYFS and ends in Y6. Our long-term plans include the unit, concept question, substantive concepts and small step, lesson by lesson progression.

Maths Term by Term Coverage 2023 - 2024						
	Autumn 1 7 weeks	Autumn 2 7 weeks	Spring 1 6 weeks	Spring 2 6 weeks	Summer 1 6 weeks	Summer 2 7 weeks
YR	Bears, Bears, Bears		I need a Hero!	Great adventures	Out of the Egg	Splash! Splash! Splosh!
	On-entry/ baseline assessments 3 weeks <u>Wk 4- Subitising</u> up to 3 <u>Wk 5- Counting, Cardinality and Ordinality</u> - 1:1 correspondence <u>Wk 6- Composition</u> of numbers to 4 <u>Wk 7- Subitising</u> up to 5	<u>Wk 1- Comparison</u> more/ fewer <u>Wk 2- Counting, Cardinality, Comparison-</u> up to 5 <u>Wk 3- Comparison-</u> comparing groups of <u>obj</u> <u>Wk 4- Composition-</u> intro part/ whole <u>Wk 5- Composition-</u> composing and decomposing numbers into parts and whole (up to 5) <u>Wk 6- Counting-</u> abstract counting <u>Wk 7- Pattern-</u> intro and <u>recog.</u> ABAB and AAB AAB patterns	<u>Wk 1- Subitising</u> patterns within 5 <u>Wk 2- Counting...</u> verbally to 20, <u>obj</u> to 10 <u>Wk 3/4- Composition</u> missing numbers and intro no bonds to 5 <u>Wk 5 -Comparison</u> equal and unequal sets <u>Wk 6- Measures</u> comparing length	<u>wk 1- Counting...</u> counting to 20 and beyond <u>Wk 2-Comparison-</u> ordering numbers to 8 <u>Wk 3- Composition-</u> concept of 5 and a bit <u>Wk 4- Subitising-</u> introduce doubles <u>Wk 5- Comparison-</u> odd/ even <u>Wk 6- Measures-</u> comparing weight/mass	<u>Wk 1- Subitising-</u> conceptual to 10 <u>Wk 2- Comparison-</u> odd/even <u>Wk 3- Composition-</u> of numbers up to 10 <u>Wk4- Counting...</u> - teen numbers <u>Wk 5- Composition-</u> adding 2 groups <u>Wk 6- 2D shape</u>	<u>Wk 1- assess/review-</u> <u>subitising</u> <u>Wk 2- ass/rev-</u> Recall no. Facts <u>Wk 3-</u> Deepening understanding of number bonds to 10 <u>Wk 4- ass/rev-</u> patterns within numbers <u>Wk 5- Comparison-</u> ordering numbers to 10 <u>Wk 6- Counting...</u> to 30 and beyond <u>Wk 7- 3D shape</u>

HLF Subject Progression Ladders

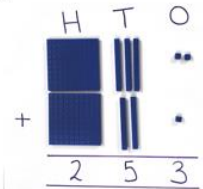
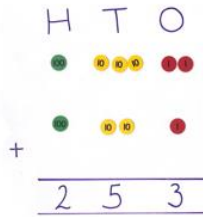
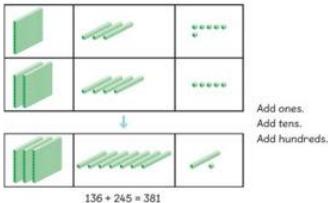
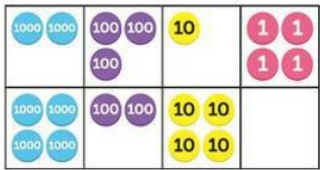
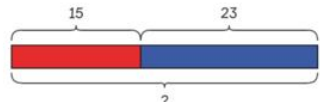
Our Subject Leads created our Subject Progression Ladders to ensure the National Curriculum is taught step by step. They illustrate the progression of skills, knowledge and vocabulary taught through EYFS, Key Stage 1 and Key Stage 2. Breaking down the National Curriculum objectives allows our teachers to plan for progression and provide all of our learners with the small steps they need. Identifying knowledge and skill progression in this way enables our teachers to plan an ambitious and effective spiral curriculum through the key stages which results in long term learning. Subject and Year Leads use the Subject Progression Ladders to design and plan assessments and for monitoring. They illustrate the progression of skills, knowledge and vocabulary taught through EYFS, Key Stage 1 and Key Stage 2.

Coverage 2023 – 2024								
	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place Value	✓	✓	✓	✓	✓	✓	✓	✓
Addition & Subtraction	✓	✓	✓	✓	✓	✓	✓	✓
Multiplication & Division			✓	✓	✓	✓	✓	✓
Fractions		✓	✓	✓	✓	✓	✓	✓
Decimals						✓	✓	✓
Fractions, Percentages and Decimals						✓	✓	✓
Ratio and Proportion								✓
Algebra								✓
Measurement	✓	✓	✓	✓	✓	✓	✓	✓
Geometry	✓	✓	✓	✓	✓	✓	✓	✓
Statistics			✓	✓	✓	✓	✓	✓

Place Value								
	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<p>Number ELG:</p> <ul style="list-style-type: none"> Have a deep understanding of number to 10, including the composition of each number. <u>Subitise</u> (<u>recognise</u>) quantities without counting) up to 5. Automatically recall (without reference to rhymes, counting or other aids) number bonds to 10, including double facts. <p>Numerical Patterns ELG:</p> <ul style="list-style-type: none"> Verbally count beyond 20, recognizing the pattern of the counting system. Compare quantities up to 10 in different contexts, <u>recognising</u> when one quantity is greater than, or less than or the same as another quantity. Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly. 		<p>By the end of Year 2, pupils should be taught to:</p> <ul style="list-style-type: none"> count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward <u>recognise</u> the place value of each digit in a two-digit number (tens, ones) identify, represent and estimate numbers using different representations, including the number line compare and order numbers from 0 up to 100; use and = signs read and write numbers to at least 100 in numerals and in words <u>use</u> place value and number facts to solve problems. 		<p>By the end of Year 4 (LKS2), pupils should be taught to:</p> <ul style="list-style-type: none"> Count in multiples of 6, 7, 9, 25 and 1000 find 1000 more or less than a given number count backwards through zero to include negative numbers <u>recognise</u> the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) order and compare numbers beyond 1000 identify, represent and estimate numbers using different representations round any number to the nearest 10, 100 or 1000 solve number and practical problems that involve all of the above and with increasingly large positive numbers <u>read</u> Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value. 		<p>By the end of Year 6 (UKS2), pupils should be taught to:</p> <ul style="list-style-type: none"> read, write, order and compare numbers up to 10 000 000 and determine the value of each digit count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 round any whole number to a required degree of accuracy use negative numbers in context, and calculate intervals across zero <u>solve</u> number and practical problems that involve all of the above. read Roman numerals to 1000 (M) and <u>recognise</u> years written in Roman numerals 	
Counting	Recite numbers past 5. Say one number for each item in order: <u>1,2,3,4,5</u> .	Count objects, actions and sounds. Link the number symbol to its cardinal number value.	Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.	Count in steps of 2, 3 and 5 from 0, and in tens from any number, forward and backward.	Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number.	Count in multiples of 6, 7, 9, 25 and 1000. Count backwards through zero to include negative numbers.	Count forwards of backwards in steps of powers of 10 for any given number up to 1 000 000. Count forwards and backwards	

HLF Calculation Policy

Our in-depth calculation policy is shared with all stakeholders.

Addition KS2			
Objective & Strategy	Concrete	Pictorial	Abstract
<p>Column method without regrouping</p> <p>Year 3</p>	<p>Using manipulatives children are to line up according to the place value columns and move the manipulatives into place to solve. Children to start with the ones column.</p> <p>Dienes:</p>  <p>Place value counters:</p> 	<p>The calculations are shown alongside the models (Dienes or place value counters) to show the connection.</p>  <p>136 + 245 = 381</p> <p>Find the sum of 2314 and 4240.</p>  <p>Pictorial bar models are used to represent word problems.</p> 	<p>Children move on to the formal written method in the expanded form. Add the ones first in preparation for the compact method.</p> $ \begin{array}{r} \text{h} \quad \text{t} \quad \text{o} \\ 6 \quad 9 \quad 2 \\ + \quad 7 \quad 0 \\ \hline \quad \quad 2 \\ 1 \quad 6 \quad 0 \\ + \quad 6 \quad 0 \quad 0 \\ \hline 7 \quad 6 \quad 2 \end{array} $ <p>Children are shown this alongside the compact method before moving to only using the compact method.</p> $ \begin{array}{r} \text{h} \quad \text{t} \quad \text{o} \\ 4 \quad 3 \quad 2 \\ + \quad 5 \quad 2 \quad 1 \\ \hline 9 \quad 5 \quad 3 \end{array} $

EYFS

Maths in EYFS is taught using the Mastering Numbers Programme from NCETM. In Development Matters, Mathematical Development is taught into strands: Number and Numerical Patterns. Children are introduced to a mastery approach to mathematical learning. By providing frequent and varied opportunities to build and apply this understanding – such as using manipulatives, including small pebbles and tens frames for organising counting – children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, ‘have a go’, talk to adults and peers about what they notice and not be afraid to make mistakes.

Substantive Knowledge




This is the subject knowledge and explicit vocabulary used to describe the past and the established facts that are central to this subject.

Golden Thread – 3D Curriculum Curriculum Drivers & Substantive Concept Mapping

Our curriculum drivers (see above) and our maths substantive concepts (see below) are the ‘golden thread’ running through our maths curriculum.


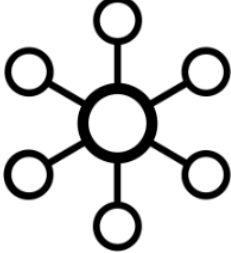



Children learn abstract concepts through meaningful examples and repeated encounters in different contexts across the curriculum. This explicit planning supports children to transfer their knowledge across the curriculum and use it to frame future learning.

This supports our work towards a 3D curriculum that promotes remembering. Our 3D curriculum is designed so that knowledge is built upon term by term, year by year and between topics across a variety of year groups. This enables our children to gain and retain more knowledge and understanding.

Maths 3D Curriculum		
Vertical Links	Horizontal Links	Diagonal Links
<p>Concepts deliberately constructed within a subject that are encountered across year groups from EYFS to Y6 (for example, the concept of part-part-whole models (representation and structure) is introduced in EYFS and built upon in every year following.)</p> 	<p>Links between subjects, commonly known as cross-curricular, or themed (for example, the concept of parallel lines is taught in Y5 and later used within art when drawing beach huts using a vanishing point)</p> 	<p>Concepts connected across both year groups and across subjects (for example, the concept of money is taught across a range of year groups and is later used specifically within Year 6 budgeting PSHCE lessons)</p> 

Teaching for Mastery - The 5 Big Ideas

The NCETM have defined 5 substantive concepts that are the suggested vehicle to teach mathematics through a mastery approach.

Fluency	Representation and Structure	Variation	Mathematical thinking	Coherence
				
<p>Knowing key mathematical facts</p> <p>Thinking flexibly</p> <p>Making connections</p>	<p>Accessing ideas</p> <p>Communicating concepts</p> <p>Making connections</p>	<p>Procedural variation</p> <p>Conceptual variation</p> <p>Making connections</p>	<p>Chains of reasoning</p> <p>Applying maths to problems</p> <p>Making connections</p>	<p>Detailed curriculum sequencing supports all to progress</p>

Substantive Knowledge

Fluency & Facts



Pupils will 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.

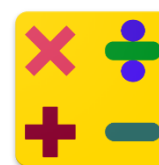
Number Facts

+	0	1	2	3
0	0+0	0+1	0+2	0+3
1	1+0	1+1	1+2	1+3
2	2+0	2+1	2+2	2+3
3	3+0	3+1	3+2	3+3

Times Tables

x	1	2	3	4	5	6
1	1	2	3	4	5	6
2	2	4	6	8	10	12
3	3	6	9	12	15	18

Symbols



Children will become fluent in number facts such as number bonds, doubles and halves, equivalents, factor pairs, primes etc.

Children will know their times tables up to 12x12 by the end of Y4. These underpin many aspects of mathematical learning (fractions, ratio, algebra, statistics)

Children will recognise and understand mathematical symbols in order to be able to read and solve calculations

Procedural Knowledge (Methods)

Children need to know specific methods (both mental and written) and be able to apply these skills with any numbers. Methods include: partitioning, number lines, column method, short multiplication, long multiplication, short division.

Disciplinary Knowledge – Thinking as a mathematician

The children are taught these disciplinary concepts within all domains of mathematics across all year groups.

Justifying and Proving



Pupils use their deep mathematical understanding to prove that statement is true or false. Sentence stems such as: 'I know because...', 'This cannot be right because...', 'I know that...' support their explanations.

Reasoning

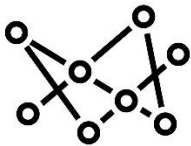




Pupils can reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.

Problem Solving



Pupils 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.

Using and Applying 	Investigating 	Analysing 
<p>Pupils solve problems of increasing complexity (i.e. where the approach is not immediately obvious), demonstrating application beyond the original context.</p>	<p>Pupils explore and investigate mathematical contexts and structures, communicate results clearly and systematically explain and generalise the mathematics.</p>	<p>Analysing data through statistics embeds other mathematical areas such as addition and subtraction, develops mathematical thinking and help pupils see the clear links to science, particularly the 'working scientifically' objectives.</p>

This is how our children learn how to be successful mathematicians and achieve our intent.

I am a Hove Learning Federation mathematician because...

- I demonstrate quick and efficient recall of facts and procedures
- I am a mathematical thinker, who reasons and solves problems
- I feel confident using mathematical vocabulary
- I can make connections in my learning to new ideas and within the world around me
- I can describe, explain and represent mathematical concepts in a variety of ways

Local Knowledge, Enrichment & Cultural Capital

Local knowledge and community

At HLF, we value the importance of our local community.

Enrichment

We provide enrichment opportunities that can happen inside or outside of the school but that complement classroom instruction. The aim is for our children to try new and varied activities that help to develop character, resilience, and motivation, and that encourage our children to pursue their interests and become lifelong learners. We know that enrichment activities can empower children to develop skills, discover passions, and foster a well-rounded education.

Cultural Capital

These are the opportunities such as trips, visits, local walks and interactions with members of our local community that are woven through our curriculum that give children the essential knowledge needed to be educated citizens that have an appreciation of how human creativity and achievement in the past has, and continues to, influence our lives.

Implementation – How do we deliver the curriculum?

-The strategies and steps that we take every day to achieve our curriculum intent

Sequencing

The fundamentals of our maths curriculum are NCETM (EYFS + KS1), Maths No Problem (KS2) and we supplement our planning using White Rose resources.



The curriculum enables our children to build a depth of knowledge, acquire and practice key skills and embed vocabulary. Each unit is strategically planned to build upon prior learning with opportunities to introduce and revisit key concepts woven throughout in order to deepen pupil understanding. An example of this is outlined below:

Y1	Wild and Wonderful		Castles and Caves		The Secret Garden	
	Place Value within 10 5 weeks	Addition & Subtraction within 10 cont. 3 weeks	Place Value within 20 3 weeks	Place value within 50 2 weeks	Multiplication and division 3 weeks	Place value within 100 2 weeks
	Addition & Subtraction within 10 2 weeks	Geometry – Shape 1 week	Addition & Subtraction within 20 3 weeks	Length and height 2 weeks	Fractions 2 weeks	Measurement – money 1 week
		Consolidation 1 week		Mass and Volume 2 weeks	Geometry – position and direction 1 weeks	Measurement – time 2 weeks
						Consolidation 1 week

For a full overview refer to *Whole School Overview 23-24*.

At the core of our classroom practice is the concrete, pictorial and abstract approach which uses physical and visual aids to build a child’s understanding of abstract topics. Pupils are introduced to a new mathematical concept through the use of concrete resources (e.g. fruit, Dienes blocks etc). When they are comfortable solving problems with physical aids, they are given problems with pictures – usually pictorial representations of the concrete objects they were using. Then they are asked to solve problems where they only have the abstract i.e. numbers or other symbols. Building these steps across a lesson can help pupils better understand the relationship between numbers and the real world, and therefore helps secure their understanding of the mathematical concept they are learning.

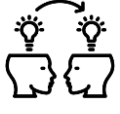




See below example from our Calculation Policy:

Addition Y2+			
Objective & Strategy	Concrete	Pictorial	Abstract
Adding multiples of ten	$50 = 30 + 20$ 	 3 tens + 5 tens = ____ tens $30 + 20 =$ ____	$20 + 30 = 50$ $70 = 50 + 20$ $40 + \square = 60$

Pedagogy



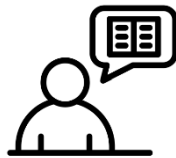
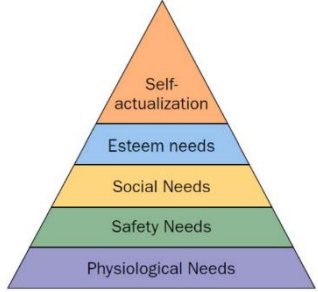

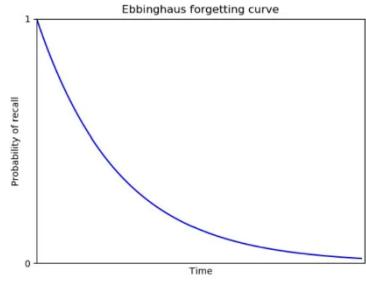
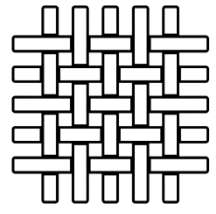
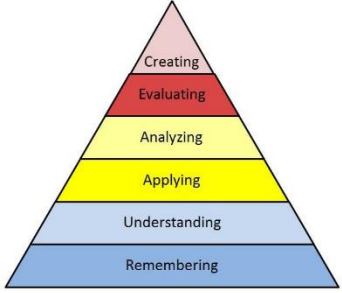




Key Principles for Effective Teaching & Learning at Hove Learning Federation

high expectations 	quality first and adaptive teaching 	developing learning behaviours 	relationships and environment 	quality of instruction
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inspire, support and challenge 	layered modelling to ensure access for all children 	subject knowledge and mastery 	effective questioning and feedback 	making it stick' - transferring knowledge to long-term memory 
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Key Theories & Evidence Based Research to design lessons and units

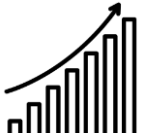




Below are the key theories and research that underpin our approach to pedagogy and guide our curriculum design. They are used to promote high quality teaching and used in staff CPD to develop strategies that ensure consistency of standards and pedagogical understanding.

Sweller's cognitive load theory 	Rosenshine's principles of instruction 	Cain and Oakhill's vocabulary instruction 	Maslow's Hierarchy of Needs 
Fiorella and Mayer's generative learning practice 	Ebbinghaus' forgetting curve 	Interleaving and Spacing 	Bloom's Taxonomy 
Retrieval Practice 	Bruner's Spiral Curriculum 	Pupil Book Study 	Education Endowment Foundation 

Assessment

Assessment opportunities are continuous and form a key part of our teaching and learning.
Formative assessment opportunities are planned in throughout our lesson model (see examples below).
Summative assessment – opportunities are planned in at the end of units and the end of the year.

Examples of in class formative assessment opportunities

deliberate practice and rephrasing of taught content 	cumulative quizzing within the learning sequence 	structured discussions in class 	retrieval and recall 	explaining and challenge partner talk 
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self and peer assessment 	teacher feedback and summaries 	diagnostic questioning 	higher order thinking and exit tickets 	summarising and explaining the Big Question from the sequence
rephrasing and thinking out loud 	key vocabulary use and application 	Professor Prove It 	Deep Diver and Submarine challenges 	lesson to lesson, unit to unit, term by term, end of year feedback & concept questions

Mapping and Planning – 7 Lenses

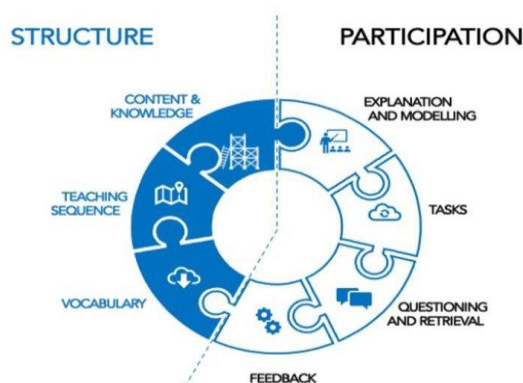
Alex Bedford's Pupil Book Study approach to quality assuring the curriculum helps us to evaluate curriculum structures, teaching methods, pupil participation and response through a dialogic model.

When undertaking these tasks, we ask the following key questions:

- How well do our children remember the content that they have been taught?
- Do books and children discussions radiate excellence?

Does learning 'travel' with our children and can they deliberately reuse it in more sophisticated contexts?

To ensure our monitoring is thorough and targeted, we identify what is helping and hindering by looking at structure and participation (see table below).



Pupil Book Study 7 Lenses						
STRUCTURE			PARTICIPATION			
Content and Knowledge	Teaching Sequence	Vocabulary	Explanation and Modelling	Tasks	Questioning and Retrieval	Feedback

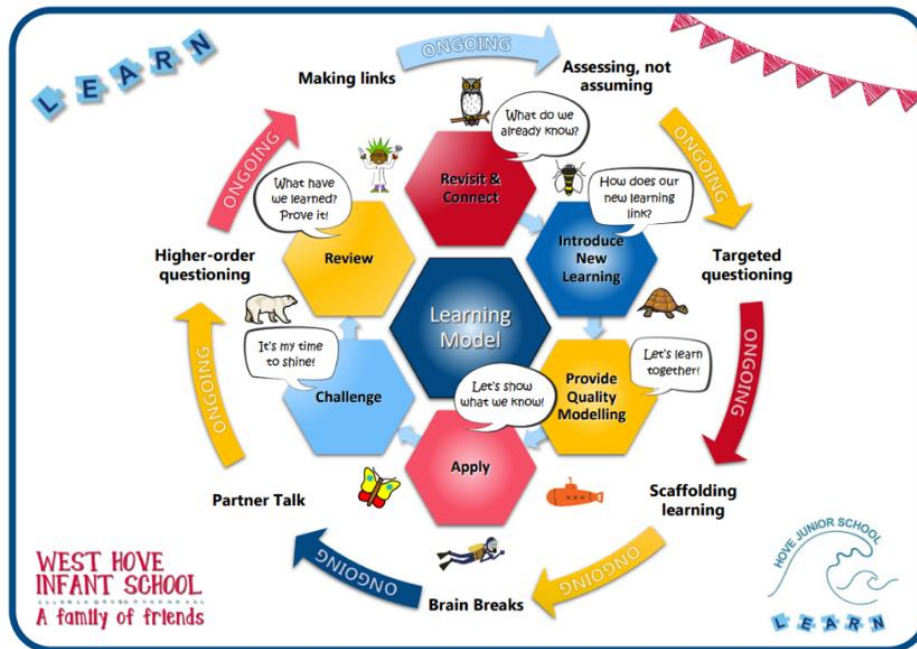
Lesson Structure/Model

Learning Model: The Enacted Curriculum

To ensure constant quality-first teaching across the curriculum we have developed the Hove Learning Federation Learning Model. As illustrated in our visual guide below, each stage of the model has been carefully crafted on the most up to date evidence based research. It is a model designed to give enable all children to:

- Revisit prior learning from previous lessons and linked units from past terms and years.
- Make links with this learnt knowledge and new learning.
- Access new learning through skilled teacher modelling.
- Apply new understanding and skills with partner and independent work.
- Experience challenge at their level.
- Review the learning for that day and be guided to see how their understanding has deepened.

Teachers do not make assumptions about children’s understanding but use a range of Assessment for Learning strategies to adjust lesson content and pace so that they are delivering the right knowledge and skills for the children they have in front of them. Learning is scaffolded to be inclusive to all and brain breaks and partner talk keep the learning engaging, accessible and challenging. Higher order questioning is used to guide children to make links and encourage considered thinking. Staff receive regular CPD on each element of the Learning Model. Areas for development are pinpointed through monitoring and targeted for improvement.



Environment and Resources

We utilise a wide range of high-quality images and diagrams within the teaching resources we provide for our children. These are carefully designed and dual coded to minimise cognitive overload and allow each child access to their learning in the most inclusive way. Wherever possible we use inspiring images, that can be zoomed in on to explain difficult concepts and images that spark discussion and challenge thinking. The use of all resources is modelled carefully by teachers so that every child knows how to succeed in each lesson.

Enrichment Opportunities

Our maths curriculum allows us to ensure that cultural capital and enrichment opportunities extend the curriculum offer for all pupils.

These events can include:

- Whole school maths days where children engage in themed activities related to a given stimulus e.g. *Let the Adventure Begin*
- Fluency days - *Time Tables Rock Stars* used as a driver for the development of number fluency with a focus on times tables

Where possible we develop children's skills of practical maths through cross-curricular opportunities:

- measurement/reading scales (Y3: Biscuit making, Y4: Bread making, Y6: Baking apple pies)
- ratio (Y6: WWII Rock cakes)
- symmetry in art
- music composition (music notation)
- data handling (Y6 Science - Heart rate experiment, Y4 Geography - reading climate graphs, Y2 Computing)
- time/timelines (History)

Diversity and Identity across the Maths Curriculum



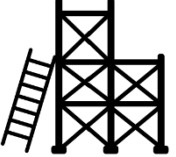


Throughout our planning and curriculum mapping, we celebrate the diversity within our community and the wider world and develop confidence in individual identity. We promote equality through the use of images and names of characters that reflect the nature of the school's pupils. Additionally, we ensure that there is a balance of gender representation within our slides and that no one gender is depicted as solving mathematical problems more effectively than another.

SEND & Inclusive Learning

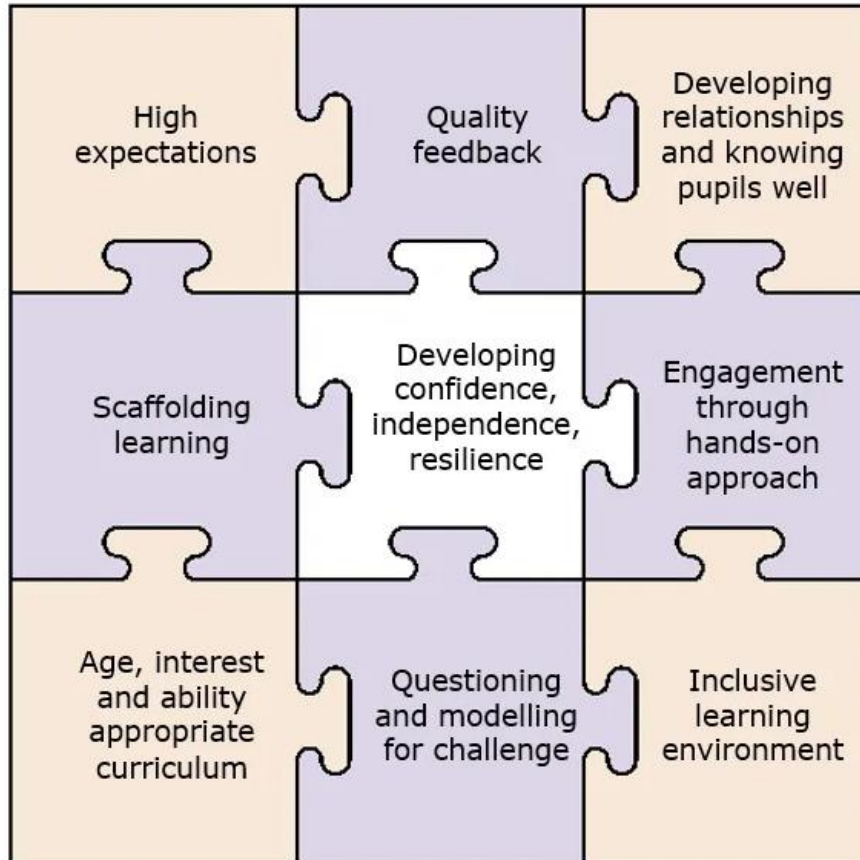
We adapt the curriculum to meet the needs of all our children so that everyone can access the learning, build on their prior knowledge, and understand the skills needed to become mathematicians.

We do this by:

	<p>-Identifying the CRITICAL CORE CONTENT that pupils with SEND need to know and use.</p>
	<p>-CHUNKING knowledge and knowledge notes/models in manageable sections</p>
	<p>-Teachers use structured RESPONSIVE FRAMEWORKS (including the use of stem sentences and sentence stems) to promote hard thinking</p>
	<p>-Teachers use structured DELIBERATE PRACTICE to increase attention and retention</p>
	<p>-Pupils with SEND are entitled to think hard. We use structured CHALLENGE FRAMEWORKS to promote hard thinking, drawing on the content, including explain the word connections and sequenced thinking paths</p>
	<p>· Dual coding (using CIP and symbols from the Noun Project) is used to pre-teach tier 2 and 3 vocabulary and is included on all lesson slides, core knowledge files and knowledge strips in Key Stage 2, and all activity sheets in Key Stage 1.</p>

	<ul style="list-style-type: none"> Higher level challenge partners and talking trios are used to ensure children with SEN and or EAL are provided with high quality talk and modelled language of history skills.
	<ul style="list-style-type: none"> Activities ensure children with SEN or EAL can access tasks appropriately and share their understanding of historical concepts.
	<ul style="list-style-type: none"> Differentiation and scaffolds are included where appropriate to enable access to learning and ensure children make at least expected progress.
	<ul style="list-style-type: none"> Pictures and quotes are taken from children with SEN and or EAL to ensure evidence is recorded in books and on The Portal (EYFS)
	<ul style="list-style-type: none"> EEF 5-A-Day approaches/strategies are reviewed and incorporated into our lessons 1 – explicit instruction, 2 – cognitive and metacognitive strategies, 3 – scaffolding, 4 – flexible grouping, 5 – using technology

The Maths No Problem SEND jigsaw is a driver for our provision:



CPD

Professional development is at the core of our teaching practice. Our Maths Team has a wealth of experience and pedagogical understanding. Both of our Maths Leads are Mastery Specialists who lead training on teaching and learning for schools in Brighton and Hove. The wider team is made up of highly skilled leaders who are part of the Sustaining Mastery network and have up to date training from the Sussex Maths Hub.

Teachers have termly Maths CPD led by specialists in the field to ensure that our teaching practice is in line with the latest research and all members of staff are upskilled to deliver engaging, high quality lessons with strong subject knowledge. ECTs have additional training sessions with the Maths Team to support their subject knowledge. They have opportunities to observe members of the team and discuss their personal development in maths. Support staff meetings are used to work with our Learning Support Assistants and Individual Needs Assistants on unpicking methods and understanding the progression of skills from EYFS to Year 6.




Impact – How do we know our curriculum is effective? Evidencing the standards of Teaching and Learning

In order to identify the impact our curriculum is having on our pupils, we check the extent to which learning has become permanently embedded in children’s long-term memory in addition to looking for excellence in their outcomes. At HLF, we use a number of tools to quality assure the implementation and impact of our curriculum such as:

- Pupil Book Studies (Subject Reviews & Shallow Splashes)
- Subject Meetings
- Subject analysis & Action plans
- Formative and Summative Assessment
- Learning observations/drop ins (subject lead, year/phase lead and SLT)
- CPD for all staff
- Governors
- Recent successes
- Next steps




Hove Learning Federation Impact

Children leave Hove Learning Federation as deeply knowledgeable and skilful learners who can set targets and believe in themselves to achieve them. They understand how to be socially, morally, spiritually and culturally responsible and aware. They are able to make positive contributions to the local and wider community and strive to be the best that they can be.

Learning Behaviours	Emotional 	Names and expresses emotions Manages impulses of personal behaviour	Shows pride in successes	Social 	Focuses on learning in class Attentive to directions, listening to the teacher	Shows empathy and appreciates diversity	Cognitive 	Organises time and space for own learning Sets goals and monitors own progress	Talks purposefully with peers, valuing other opinions
Attitudes to Learning	Love of Learning and lifelong learners	Positive	Curious and Inquisitive	Independent	Able to work in teams	Motivated and Hardworking	Resilient	Proud	Ready for secondary school
Quality of Education	Evidence of learning	Attainment	Progress	Skills, knowledge and understanding	Personal Development	Relationships between pupils and staff	Learning atmosphere and environment	Professional Development	School Improvement

Pupil Book Studies – Subject Reviews & Shallow Splashes

At HLF, we have created our own monitoring systems that incorporate the key principles from the Pupil Book Study (see

<p>Flip/PowerPoint and planning look</p> 	<ul style="list-style-type: none"> • Planning for small steps • Progress and learning over time • Knowledge and skills based • Child centred, active learning • Consistency with the use of the HLF Learning Model across year groups and sites
<p>Book Look</p> 	<ul style="list-style-type: none"> • Shows progress of knowledge and skills • Shows development of learning and understanding • Demonstrates a clear sequence of learning • High expectations, consistency and pride in work
<p>Pupil Voice</p> 	<ul style="list-style-type: none"> • Use precise vocabulary • Show a deep understanding of the learning • Are enthusiastic about their learning • Talk through the learning sequence • Highlight how the learning builds lesson to lesson and unit to unit

'Implementation'). They are called Subject Reviews and Shallow Splashes. Through this form of monitoring, we quality assure each subject by carrying out:

- 1) Learning walks – subject teams and SLT support teaching and learning and record positives and good practice to share and inspire
- 2) Flip/PowerPoint and planning looks – to check planning & resources meet the needs of all of our learners. We check against our lesson model, Rosenshine's Principles of Instruction and the key theories & research that underpin our teaching philosophy
- 3) Book looks - to check for incremental small steps, sequencing, task design, scaffolds, personalisation, knowledge & skill progression, vocabulary, access, support & challenge
- 4) Pupil voice – to discuss the learning and see the subject through the eyes of the child. Part of our questioning is designed to assess the impact of our lessons, that they provide enjoyment, that children can articulate their learning with key vocabulary and that learning is 'sticking' in the children's long-term memory

Findings from our monitoring systems are categorised into positives and next steps. These can be specific to year group, to key stage or whole school (across the 3 sites). To ensure next steps are acted on, subject and year teams identify actions and assign responsibility. This monitoring feeds into our subject analysis and action plans (see 'Subject analysis and Action plans' below).

Subject Meetings

Subject team meetings are timetabled regularly throughout the year. Time is set aside during staff meetings, INSET days and yearly meetings with SLT. The aims of these meetings are to:

- Review current practise and impact
- Set targets, identify actions, and create plans
- Discuss the latest research and evidence to ensure our subjects are up to date and plans are in place to progress
- Work towards our school key priorities
- Give time to professional development and to offer support to our teachers

Subject analysis & Action plans

Each subject has an action plan for the academic year to monitor change and progress across a variety of objectives and goals within multiple areas (e.g., student, classroom, professional development, etc.). Using our school key priorities as a guide, our teams review and RAG their subjects throughout the year and set new targets each term. Each target is a story arc that shows how a subject leader has identified a next step, actioned it and reviewed the impact so that subject development is continuous and effective.

Each subject team uses the table below to reflect, plan, set actions, assess impact and discuss next steps.

What did you notice? (Why did you set this target?)	Action (What will you do?)	Intended Impact (What will this look like?)	Responsibility	By when	Evidence for Monitoring
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Formative and Summative assessments

Our assessment structures are designed to ensure that our children will know more, remember more and be able to do more. A mixture of formative and summative assessments allows us to evaluate if our curriculum helps or hinders the goal of achieving persistent change in the long-term memory of our children.

Formative Assessment

We assess formatively throughout each lesson using our learning model (see 'Implementation' section). This tool ensures each lesson is planned and delivered to maximise assessment opportunities. Teachers use this information to support, challenge and adapt the learning.

Each subject assesses in a range of different ways (see 'Implementation' section).

Summative Assessment

Our curriculum is a progressive, spiral model. Teachers use deliberate summative assessment to measure if children are making progress as they journey through the curriculum. The range of summative assessment methods that teachers use build a picture of children's understanding of:

- Content and knowledge
- Use of vocabulary
- Ability to access the curriculum and thrive

All information gained from assessments are used to tailor, target and adapt future planning, teaching and learning.