Subject overview: Maths

What does a mathematician look like at Mengham Infants? What personal skills and characteristics of learning, are particularly relevant for this subject?
Mastering Maths at Mengham means that we can all understand and do mathematics. We all want to understand why and how mathematical concepts work as well as recognise the value of mathematics by real-life situations and linking purposefully to other curriculum areas.

At Mengham Infant School we are **fluent** in the fundamentals of Maths so that they develop conceptual understanding and are able to recall and apply knowledge rapidly and accurately. Children use and progress through concrete, pictorial and abstract representations at all stages of mathematics while ensuring that early maths is always supported with a focus on the concrete and pictorial. We want to have mathematicians that can **solve** problems by applying their mathematics creatively to a variety of problems, including in unfamiliar contexts and real-life scenarios. All children should be able to **reason** mathematically and are constantly using full sentences to explain what they are doing and deepen their understanding.

This document is to be used in parallel with the 'calculation policy' and 'vocabulary' documents.

These are the key skills and knowledge that a Mathematician will develop during each year (**not just EYFS/NC objectives**):

Year R	Year 1	Year 2
Number and Place Value		
Up to 5 -> 10 -> 20: Numerals of personal significance. Recognises numerals 1 to 5. Saying one number name for each item -> 3-4 objects Count actions or objects which cannot be moved. Use numerals to represent 1 to 5 objects Counts objects to 5-> then irregular arrangement Use 'more' and 'fewer' to compare two sets of objects. Finds the total number of items in two groups by counting all of them. Say 1 more Find 1 more or less Estimates and checks by counting Writing and ordering numerals to 20	*Within 10* Sort objects Count objects Represent objects Count, read and write forwards and backwards from any number 0 to 10 Count one more or less 1:1 correspondence to start to compare groups Compare groups using words such as: equal, more/greater, less/fewer Introduce <, > and = symbols Compare numbers Order groups of objects Order numbers Ordinal numbers The number line *Within 20* Count forwards and backwards to 20 in numerals and words Numbers from 11 to 20	Count objects to 100 and read and write numbers in numerals and words Represent numbers to 100 Tens and ones with a part whole model Tens and ones using addition Using a place value chart Compare objects Compare numbers Order objects and numbers

	Tens and ones Count one more and one less Compare and order groups of objects and numbers *Within 50* Numbers to 50 Tens and ones Represent numbers to 50 One more one less Compare objects and numbers within 50 Order numbers within 50 *Within 100* Counting to 100 Partitioning numbers Comparing and ordering numbers One more, One less	
Addition and subtraction		
Add and sub within 10 In practical activities and discussion, beginning to use the vocabulary involved in adding and subtracting. Records, using marks that they can interpret and explain but progressing to using numerals above.	*Within 10* Part whole model Add symbol Fact families - Add facts Find number bonds within 10 Systematic methods for number bonds within 10 Number bonds to 10 Compare number bonds Addition = adding **together** then adding **more** Finding a part Subtraction – Taking away, how many left? Subtract symbol Subtraction – Finding a part, breaking apart 8 Facts (Use equal sign in both places) Count back Find the difference Compare statements a+b>c then a+b>c+d	Fact families – Addition and subtraction bonds to 20 Check calculations Compare number sentences Related facts Bonds to 100 (tens) Add and subtract 1s 10 more and 10 less Add and subtract 10s Add a 2-digit and 1-digit number – crossing ten Subtract a 1-digit number from a 2-digit number – crossing ten Add two 2-digit numbers – not crossing ten – add ones and add tens Add two 2-digit numbers – crossing ten – add ones and add tens Subtract a 2-digit number from a 2-digit number – not crossing ten

	Within 20 Add by counting on Find and make number bonds Add by making 10 Subtraction not crossing 10 Subtraction crossing 10 Related facts Compare number sentences	Subtract a 2-digit number from a 2-digit number – crossing ten – subtract ones and tens Bonds to 100 (tens and ones) Add three 1-digit numbers

Multiplication and Division		
* Bold denotes taught in NPV unit but reinforced in M + D unit		
In practical activities and discussion, begin to use the vocabulary involved in doubling, halving and sharing. Exceeding only: Start with practical problems that involve sharing and grouping into 2s, 5s and 10s.	**Counting in 2s** **Counting in 5s** Count in 10s Make equal groups Add equal groups Make arrays Make doubles Make equal groups – grouping Make equal groups – sharing	**Count in 2s, 5s and 10s** **Count in 3s** Recognise equal groups Make equal groups Add equal groups Using the X symbol Use arrays 2 times table 5 times table 10 times table Make equal groups – sharing Make equal groups – grouping Divide by 2 Odd and Even Divide by 5 Divide by 10

Fractions		
See Multiplication and Division	Find a half Find a quarter *Not using the fractional notation ½ or ¼ at this stage.*	Make equal parts Recognise half Find a half Recognise a quarter Find a quarter Recognise a third Find a third

		Unit fractions Non-unit fractions Equivalence of ½ and ¼ Find ¾ Count in fractions
Shape		
Beginning to use mathematical names for 'solid' 3D shapes and 'flat' 2D shapes, and mathematical terms to describe shapes. Selects a particular named shape. Use familiar objects and common shapes to create and recreate patterns and build models	Recognise and name 3-D shapes Sort 3-D shapes Recognise and name 2-D shapes Sort 2-D shapes Patterns with 3-D and 2-D shapes	Recognise 2-D and 3-D shapes Count sides on 2-D shapes Count vertices on 2-D shapes Draw 2-D shapes Lines of symmetry Sort 2-D shapes Make patterns with 2-D shapes Count faces on 3-D shapes Count edges on 3-D shapes Count vertices on 3-D shapes Sort 3-D shapes Make patterns with 3-D shapes
Position and Direction		
Can describe their relative position such as 'behind' or 'next to'	Describe turns Describe positions (1) Describe positions (2) *Use the vocabulary: full, half, quarter, 3 quarter left, right, up, down, top, middle, bottom, above, below building on Year R language.*	Describing movement Describing turns Describing movement and turns Making patterns with shapes *Use the vocabulary: As year 1 but also including clockwise and anti-clockwise*
Money		
As part of role play, children explore the role and use of money. They may begin to identify certain coins.	Recognising coins Recognising notes Counting in coins	Count money – pence Count money – pounds (notes and coins) Count money – notes and coins Select money Make the same amount

		Compare money Find the total Find the difference Find change Two-step problems
Time		
Children discuss routines as part of the school day using key vocabulary such as: now, next later, before etc. Uses everyday language related to time Orders and sequences familiar events – Days of the week, months of the year	Before and after Dates Time to the hour Time to the half hour Writing time – Exploring time in seconds, minutes and hours. Suggesting equipment to use Comparing time – Faster, slower, earlier, later	O'clock and half past Quarter past and quarter to Telling time to 5 minutes Minutes in an hour, hours in a day Find durations of time Compare durations of time
Statistics		
	Children begin to record and collect information as part of science and other cross-curricular areas. They then answer questions about and interpret this information.	Make tally charts Draw pictograms (1-1) Interpret pictograms (1-1) Draw pictograms (2, 5 and 10) Interpret pictograms (2, 5 and 10) Block diagrams
Measurement		
Orders two or three items by length or height Orders two or three items by weight or capacity	*Non standard units and using a ruler to the nearest cm* **Length and Height:** Compare lengths and heights Measure length in NS and S units **Weight and Volume:** Introduce weight and mass Measure mass Compare mass Introduce capacity and volume	*Scales should be where all the parts are marked and progress to being between 2 intervals.* **Length and Height:** Measure length (cm) Measure length (m) Compare lengths Order lengths Four operations with lengths **Mass, capacity and temperature:**

	Measure capacity Compare capacity	Compare mass Measure mass in grams Measure mass in kilograms Compare capacity Millilitres Litres Temperature

- Are children able to confidently talk about their maths using key vocabulary?
- Are children able to reason about their maths using their understanding of key concepts?
- Are children able to recall key facts quickly and accurately to increase their speed of calculating?