Hampshire Medium Term Plans for Mathematics: Year 4

Term	Wk1	Wk2	Wk3	Wk4	Wk5	Wk6		Wk7	Wk8	Wk9	Wk10	Wk11	Wk12	
Autumn	A1			B1			Half Term	M1	C1		D1			End of Term
Spring	A2			B2		M2		C2			D2		M3	
Summer	A3			B3				C3			D3		M4	

Content common to all blocks	**Block A**	**Block B**	**Block C**	**Block D**
Fluency (Place value and a sense of number) Problem solving Reasoning	Addition and subtraction (for whole and part numbers) Geometry and Measure	Multiplication and division (for whole and part numbers) Statistics and Measure	Addition and subtraction (for whole and part numbers) Geometry and Measure	Multiplication and division (for whole and part numbers) Statistics and Measure

Notes

- Assessment Milestones (M1-4) based on HAM phase model, KPIs and end of year expectations.
- Big Ideas taken from NCETM Assessment for Mastery documents
- The use of concrete, pictorial and abstract multiple representations for number and calculation is implicit in every lesson.
- Recording should always show a range of representations including, as appropriate, the number line; use of Dienes, Numicon, Cuisenaire etc.; arrays; bar models; informal jottings; different ways to solve the same problem using the child's own recording methods and more formal methods when ready.

It is better to have five ways to solve one problem, than one way to solve five.
Can you: Say it; make it; draw it; write it; explain it?

Five Questions to support mathematical thinking

- **If you know this, then what else do you know?**
- **Can you give me an example of…. and another….and another…?**
- **What if you change….?**
- **Which is harder and which is easier…..?**
- **What is the same and what is different?**

The Big Ideas in Mathematics: Y4: NCETM	
Number and PV	• Imagining the position of numbers on a horizontal number line helps us to order them: the number to the right on a number line is the larger number. So 5 is greater than 4, as 5 is to the right of 4. But –4 is greater than –5 as –4 is to the right of –5. • Rounding numbers in context may mean rounding up or down. Buying packets of ten cakes, we might round up to the nearest ten to make sure everyone gets a cake. • Estimating the number of chairs in a room for a large number of people we might round down to estimate the number of chairs to make sure there are enough. • We can think of place value in additive terms: 456 is 400 + 50 + 6, or in multiplicative terms: one hundred is ten times as large as ten.
Addition and Subtraction	• It helps to round numbers before carrying out a calculation to get a sense of the size of the answer. For example, 4786 – 2135 is close to 5000 – 2000, so the answer will be around 3000. Looking at the numbers in a calculation and their relationship to each other can help make calculating easier. For example, 3012 – 2996. Noticing that the numbers are close to each other might mean this is more easily calculated by thinking about subtraction as difference.
Multiplication and Division	• It is important for children not just to be able to chant their multiplication tables but to understand what the facts in them mean, to be able to use these facts to figure out others and to use them in problems. • It is also important for children to be able to link facts within the tables (e.g. 5× is half of 10×). • They understand what multiplication means and see division as both grouping and sharing, and to see division as the inverse of multiplication. • The distributive law can be used to partition numbers in different ways to create equivalent calculations. For example, $4 \times 27 = 4 \times (25 + 2) = (4 \times 25) + (4 \times 2) = 108$. • Looking for equivalent calculations can make calculating easier. For example, 98×5 is equivalent to $98 \times 10 \div 2$ or to $(100 \times 5) – (2 \times 5)$. The array model can help show equivalences.
Fractions	• Fractions arise from solving problems, where the answer lies between two whole numbers. • Fractions express a relationship between a whole and equal parts of a whole. Children should recognise this and speak in full sentences when answering a question involving fractions. For example, in response to the question *What fraction of the chocolate bar is shaded?* the pupil might say *Two sevenths of the whole chocolate bar is shaded.* • Equivalency in relation to fractions is important. Fractions that look very different in their symbolic notation can mean the same thing.
Measurement	• The smaller the unit, the greater the number of units needed to measure (that is, there is an inverse relationship between size of unit and measure).

Geometry	• During this year, pupils increase the range of 2-D and 3-D shapes that they are familiar with. They know the correct names for these shapes, but, more importantly, they are able to say why certain shapes are what they are by referring to their properties, including lengths of sides, size of angles and number of lines of symmetry. • The naming of shapes sometimes focuses on angle properties (e.g. a rectangle is right-angled), and sometimes on properties of sides (e.g. an equilateral triangle is an equal sided triangle). • Shapes can belong to more than one classification. For example, a square is a rectangle, a parallelogram, a rhombus and a quadrilateral.
Statistics	• In mathematics the focus is on numerical data. This can be discrete or continuous. • Discrete data are counted and have fixed values, for example, the number of children who chose red as their favourite colour (this has to be a whole number and cannot be anything in between). • Continuous data are measured, for example at what time did each child finish the race? (Theoretically this could be any time: 67.3 seconds or 67.333 seconds, depending on the degree of accuracy this is applied) • Continuous data are best represented with a line graph where every point on the line has a potential value.

Autumn Term Y4	Place Value and a Sense of Number	Problem Solving and Reasoning	Core Calculation (four rules for whole and part numbers)	Geometry, Measure and Statistics
A1	Find 1000 more than any given number Recognise the place value of each digit in a four-digit number (Th, H, T, O)	Solve addition and subtraction two-step problems in context, deciding which operations to use and why	<u>Addition and Subtraction</u> Add and subtract three digit numbers using a variety of strategies Estimate and use inverse operations to check answers to a calculation (use bar modelling and number lines to explain the structure)	<u>Geometry</u> Compare and classify geometric shapes, based on their properties and sizes. Identify acute and obtuse angles Complete a simple symmetric figure with respect to a specific line of symmetry. Describe positions on a 2D grid as coordinates in the first quadrant <u>Measure</u> Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres
B1	Count in multiples of 25	Solve problems involving	<u>Multiplication and Division</u>	<u>Statistics</u>

	and 1000. Identify multiples of 2,3,4 and 8, using patterning to generate the next multiple. Identify, represent and estimate numbers using different representations. Round any number to the nearest 10, 100 Round decimals with one dp to the nearest whole number	multiplying and dividing by 10 and 100.	Use place value and known and derived facts to multiple and divide mentally, with informal jottings. <u>Fractions</u> Recognise and show using diagrams simple equivalent fractions Divide a one- or two-digit number by 10 or 100 (÷ or x by 100 = convert between £ and p, m and cm; ÷ or x by 10 = convert between cm and mm) Add or subtract fractions with the same denominator beyond one whole.	Interpret and present discrete and continuous data using bar charts and line graphs to show time. <u>Measure</u> Estimate, compare and calculate with money in £ and p Convert between pounds and pence
Assessment Milestone 1				
HALF TERM				
C1	Order and compare numbers beyond 1000	Solve problems involving addition and subtraction with numbers up to four digits in context. Encourage pupils to estimate and show them 1000 objects for a sense of size of number.	<u>Addition and Subtraction</u> Add and subtract with up to four digits, using a range of representations and informal recording	<u>Geometry</u> Compare and classify geometric shapes, including different quadrilaterals, based on their properties. Identify lines of symmetry in 2-D shapes presented in different orientations <u>Measure</u> Read, write and convert between analogue and digital 12 and 24-hour clocks
D1	Count in multiples of 6 Round any number to the nearest 10, 100 or 1000	Solve simple measure and money problems involving fractions	<u>Multiplication and Division</u> Recall and use multiplication and division facts for, 2x, 3x, 4x, 5x, 6x, 8x <u>Fractions</u>	<u>Measure</u> Estimate, compare and calculate with mass in kg / g Convert between kg and g

			Recognise that hundredths arise when dividing a quantity by 100 and dividing tenths by 10. Find the effect of dividing a one-or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths.	
CHRISTMAS HOLIDAYS				

Spring Term Y4	Place Value and a Sense of Number	Problem Solving and Reasoning	Core Calculation (four rules for whole and part numbers)	Geometry , Measure and Statistics
A2	Count backwards through zero to include negative numbers	Use partitioning with appropriate resources, models and images to reason about how column methods work (conceptual to support procedural)	<u>Addition and Subtraction</u> Add and subtract with up to four digits, beginning to develop column methods with concrete and pictorial representations alongside	<u>Geometry</u> Describe movements between positions as translations of a given unit to the left/right and up/down (the square has moved 3 squares to the left and 2 squares down) Plot given points to draw the sides to complete a polygon. <u>Measure</u> Estimate, compare and calculate with capacity in litres and ml
B2	Count in multiples of 6, 25 and 1000 (link to 2x, 3x, 4x, 5x and 10x)	Solve problems involving multiplying and dividing using the distributive law (partitioning) to multiply two-digit by one-digit numbers	<u>Multiplication and Division</u> Multiply by 0 and 1, divide by 1. Multiply a two-digit or three-digit number by a one-digit number in informal ways, developing the idea of partitioning to support multiplying (use Dienes to show	<u>Measure</u> Convert between units of length: km, m , cm Convert between different units of capacity: litres and ml

			this) Fractions Recognise and show, using diagrams, families of common equivalent fractions (use bar model and Cuisenaire rods to support this)	
Assessment Milestone 2				
HALF TERM				
C2	Read Roman numerals to 100 (I to C) and know that, over time the numeral system changed to include zero and the concept of place value	Solve simple money and measure problems involving fractions and decimals to 2dps.	Addition and Subtraction Add and subtract with up to four digits, developing column methods where appropriate, with concrete and pictorial representations alongside	Geometry Compare and classify geometric shapes including different triangles, based on their properties. Identify acute and obtuse angles and compare and order angles up to two right angles by size.
D2	Order and compare numbers beyond 1000 Identify 1, 10, 100 more and less to support efficient calculation. Count up and down in hundredths. Recognise and write decimal equivalents of any number of tenths or hundredths	Solve contextual integer scaling problems, such as four times as high. Solve contextual correspondence problems, such as 3 hats and 4 coats ~ how many different outfits?	Multiplication and Division Know or quickly derive multiplication and division facts up to 12x12 (arrays, repeated addition, partitioning) Use factor pairs in mental calculations and partitioning (the distributive law) to multiply up to 2-dogit by 1-digit numbers Develop a reliable written method for multiplication of 2-digit or 3-digit by 1-digit numbers. Fractions Recognise and write decimal equivalents to ½, ¼ and ¾ Compare numbers with the same number of decimal places up to two dps	Measure Convert between hours and minutes; minutes to seconds; years to months; weeks to days.

Assessment Milestone 3				
EASTER HOLIDAYS				
Summer Term Y4	Place Value and a Sense of Number	Problem Solving and Reasoning	Core Calculation (four rules for whole and part numbers)	Geometry and Measure
A3	Explore partitioning up to numbers in different ways. How many ways can a partition 3? (3+0; 2+1; 1+1+1) How many ways can I partition 19 into two parts? (19+0; 18+1; ….) Model heuristics such as being systematic and patterning.	Solve problems involving length where lengths are given in two different units so that pupils must convert before solving e.g. I walked 3500 m and my friend walked 3.6 km. Who walked furthest, justify your answer.	<u>Addition and Subtraction</u> Continue to develop fluency with addition and subtraction by working with a few four digit examples and generating all possible representations and solutions e.g. 2563 + 3491 can be solved in a variety of ways. What could it mean? Crowds at a sports match / ants in two ant hills …. Show the solution using as many different ways as possible (bar model, Dienes, partitioning in a range of ways, rounding and adjusting the answer and so on	<u>Geometry</u> Plot specified points to complete a polygon on a coordinate grid. Reason about possible places if the final point in the quadrilateral makes it into a kite, or a rectangle, or a parallelogram <u>Measure</u> Convert between length measurements (km, m, cm and mm)
B3	Round numbers to the nearest whole number, 10, 100, 1000. Use rounding to estimate answers. Explore decimal partitions of 1 and compare to known number bonds	Solve comparison, sum and difference problems involving a range of statistical charts and graphs.	<u>Multiplication and Division</u> Recall multiplication and division facts up to 12x12 (explore a range of representations to enable pupils to quickly call the facts to mind) <u>Fractions</u> Multiply and divide by 10, 100 and 1000 in context. Convert between fractions and decimals	<u>Measure</u> Convert between mass measurements (kg, g) <u>Statistics</u> Interpret and present discrete and continuous data using appropriate graphical methods including bar charts and time graphs.
HALF TERM				
C3	Count in multiples of 6,7,9	Solve problems involving capacity and mass where pupils need to convert between units	<u>Addition and Subtraction</u> Continue to develop efficient written and mental methods, performing calculations	<u>Geometry</u> Draw shapes with accuracy using mathematical

		to find a solution and justify that solution,	with increasingly large numbers (up to four digits but could bridge to 10,000). Ensure that pupils reason about their chosen method and justify their choice with multiple representations. Generate 'new for old' by identifying 'nearly numbers'. e.g. 2500 – 999 is nearly 2500 -1000 = 1500 (so my answer is 1501).	reasoning and analyse shapes and their properties, describing the relationship between them (all have four sides, both have sides of equal length, both have four equal angles..) Measure Convert between capacity measurements (litres and ml)
D3	Count backwards through zero to include negative numbers.	Solve a contextual problem that requires all four operations and fractions (perhaps a budget for an end of term party, or a summer holiday, or a recipe (and cost) for a party drink for 5, 10, 100 children)	Multiplication and Division Develop formal methods of short multiplication and short division with appropriate models and images alongside Fractions Independently identify equivalent fractions using the multiplicative relationship between the numerator and the denominator (e.g.in quarters, the denominator is always four times the numerator)	Measure Use measuring instruments accurately, making connections between measure and number (e.g. recipes, mixing fruit cocktails, the perimeter of the playground…)
END OF YEAR ASSESSMENT AND TRANSITION DIALOGUE (Milestone 4)				
SUMMER HOLIDAYS				

UNIT PLANNING MODEL

Week	Date	Block	Unit	Big ideas, unit objectives, hot and cold tasks with key activities, resources, models and images. (now construct the connected learning journey – link to previous learning)
1	04-09-17	A1	Geometry	
2	11-09-17	A1	Addition and Subtraction	
3	18-09-17	A1	Addition and Subtraction	
4	25-09-17	A1	Statistics and Measure	
5	02-10-17	B1	Measure	
6	09-10-17	B1	Multiplication and Division	
7	16-10-17	B1	Division and Fractions	
Milestone 1				
Half Term				
8	30-10-17	C1	Geometry	
9	06-11-17	C1	Addition and Subtraction	
10	13-11-17	C1	Addition and Subtraction	
11	20-11-17	D1	Statistics and Measure	
12	27-11-17	D1	Fractions	
13	04-12-17	D1	Multiplication and Division	
14	11-12-17	D1	Multiplication and Division	
Christmas Holiday				

What planning a learning journey looks like!

Identify key tasks ~ plan the journey ~ choose the 'cold task' ~ design the 'hot task'