HVPA Maths Updated Sequence of Learning Progression – Year 6

This overview breaks down each of the Programmes of Study and domains covered by Year 6 and shows the approximate amount of weeks expected in the teaching of each area. Time is built in for consolidation and extension (based on the security of pupils' understanding & readiness to move on, challenge through problem solving and reasoning) and assessment within each term. Year 6 progression: compared with the first edition, there is not much change to the sequence of units for Term A. Note that Imperial and Metric units are included, rather than Position and Direction. The four-week fractions block has been split into two parts, one covering addition and subtraction and the other multiplication and division. Converting units has been brought forward from the Spring term to reinforce multiplication and division by powers of 10 covered in the Four operations block. Resources to have ready: in the Autumn term you are mostly going to need place value counters and grids.

Changes within the Learning Progressions:

Numbers to 10 000 000

- There is more revision of numbers of the size children met in Year 5.
- Place value charts are used more extensively to emphasise the structure of numbers in "groups of threes" – 1s, 10s, 100s followed by 1,000s, 10,000s and 100,000s
- Multiplicative connections between numbers has more emphasis e.g. 100 times the size, one hundredth the size of…
- Use of the number line has more emphasis, including dividing into 2,4, 5 and 10 sections

Addition & Subtraction, Multiplication & Division

- An explicit step has been included to check understanding of the rules of divisibility.
- The progression in the block is now even clearer, for example the sequence of learning for long division has been improved.
- More emphasis is placed on problem solving, including using the appropriate method for a calculation.

Fractions

- There is more introductory work on equivalent fractions before moving to simplifying.
- The progression in the block is now even clearer, for example the sequence of learning for long division has been improved.
- More emphasis is placed on problem solving, including using the appropriate method for a calculation
- An extra step has been included with mixed questions to support children to identify the correct operation and correct method of solution.

Autumn Term					
Strand	**PM Unit**	**PM Unit Title**	**Lesson**	**NC Objective 1**	**NC Objective 2**
Number – Number and Place Value (approx. 1½ weeks)	1	Place value within 10,000,000 (8 lessons)	Numbers to 1,000,000	Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit	Solve number and practical problems
			Numbers to 10,000,000		
			Partition numbers to 10,000,000		
			Powers of 10		
			Number line to 10,000,000		
			Compare and order any number		
			Round any number	Round any whole number to a required degree of accuracy	
			Negative numbers	Use negative numbers in context, and calculate intervals across zero	
Number – addition, subtraction, multiplication and division (approx. 4 weeks)	**2**	Four Operations (1) (8 lessons)	Add integers	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	
			Subtract integers		
			Problem solving – addition and subtraction		
			Common factors	Identify common factors, common multiples and prime numbers	
			Common multiples		
			Rules of divisibility		Use their knowledge of the order of operations to carry out calculations involving the four operations
			Primes to 100		
			Squares & Cubes	Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) (Y5)	
	3	Four Operations (2) (12 lessons)	Multiply by a 1-digit number	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication	
			Multiply up to a 4-digit number by a 2-digit number		
			Short division	Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context	
			Division using factors	Identify common factors, common multiples and prime numbers	Divide numbers up to 4 digits by a two-digit number using the formal written method of

					short division where appropriate, interpreting remainders according to the context
			Divide a 3-digit number by 2-digit (long division)	Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context	
			Divide a 4-digit number by 2-digit (long division)	Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context	Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
			Long division with remainders		
			Order of operations	Use their knowledge of the order of operations to carry out calculations involving the four operations	
			Brackets		
			Mental calculations (1)	Perform mental calculations, including with mixed operations and large numbers	
			Mental calculations (2)		
			Reason from known facts	Use their knowledge of the order of operations to carry out calculations involving the four operations	Solve problems involving addition, subtraction, multiplication and division
Number – fractions (approx. 3½ weeks)	**4**	Fractions (1) (9 lessons)	Equivalent fractions and simplifying	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination	
			Equivalent fractions on a number line	Compare and order fractions, including fractions > 1	
			Compare and order fractions		
			Add and subtract simple fractions	Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions	
			Add and subtract any two fractions		
			Add mixed numbers		
			Subtract mixed numbers		
			Multi-step problems		
			Problem solving – add & subtract fractions		
	5	Fractions (2) (9 lessons)	Multiply fractions by integers	Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	
			Multiply fractions by fractions (1)	Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, ¼ × ½ = 1/8]	
			Multiply fractions by fractions (2)		
			Divide a fraction by an integer (1)	Divide proper fractions by whole numbers [for example, 1/3 ÷ 2 = 1/6]	
			Divide a fraction by an integer (2)		
			Divide a fraction by an integer (3)		
			Mixed questions with fractions	Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions	Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, ¼ × ½ = 1/8]
			Fraction of an amount	Use written division methods in cases where the answer has up to two decimal places	
			Fraction of an amount – find the whole		
Measurement (approx. 1 week)	**6**	Measure – Imperial & Metric measures (5 lessons)	Metric measures	Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places	
			Convert metric measures	Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places	Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
			Calculate with metric measures	Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate	
			Miles and kilometres	Convert between miles and kilometres	
			Imperial measures	Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places	
Spring Term					
Strand	**PM Unit**	**PM Unit Title**	**Lesson**	**NC Objective 1**	**NC Objective 2**
Ratio and Proportion (approx. 2 weeks)	**7**	Ratio & Proportion (9 lessons)	Use ratio language	Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples	
			Introduce the ratio symbol		
			Use ratio		
			Scale drawing		
			Scale factors		
			Similar shapes		
			Ratio problems		
			Problem solving – ratio and proportion (1)		Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
			Problem solving – ratio and proportion (2)		
Algebra (approx. 2½ weeks)	**8**	Algebra (11 lessons)	Find a rule – one step	Generate and describe linear number sequences	
			Find a rule – two steps		
			Form expressions		
			Substitution (1)		

			Substitution (2)	Express missing number problems algebraically	Generate and describe linear number sequences
			Formulae	Use simple formulae	
			Form and solve equations	Express missing number problems algebraically	
			Solve one-step equations		
			Solve two-step equations		
			Find pairs of values	Find pairs of numbers that satisfy an equation with two unknowns	
			Solve problems with two unknowns	Enumerate possibilities of combinations of two variables	Find pairs of numbers that satisfy an equation with two unknowns
Number – fractions (including decimals and percentages) (approx. 3½ weeks)	**9**	Decimals (9 lessons)	Place value to 3 decimal places	Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places	Solve problems which require answers to be rounded to specified degrees of accuracy
			Round decimals		
			Add and subtract decimals	Solve problems which require answers to be rounded to specified degrees of accuracy	
			Multiply by 10, 100 and 1,000	Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places	
			Divide by 10, 100 and 1,000		
			Multiply decimals by integers	Multiply one-digit numbers with up to two decimal places by whole numbers	
			Divide decimals by integers	Use written division methods in cases where the answer has up to two decimal places	Solve problems which require answers to be rounded to specified degrees of accuracy
			Fractions to decimals	Associate a fraction with division and calculate decimal fraction equivalents [for example, 0·375] for a simple fraction [for example, 3/8]	Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places
			Fractions as division	Associate a fraction with division and calculate decimal fraction equivalents [for example, 0·375] for a simple fraction [for example, 3/8]	
	10	Percentages (8 lessons)	Understand percentages	Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts	
			Fractions to percentages		
			Equivalent fractions, decimals and percentages	Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts	
			Order fractions, decimals and percentages	Compare and order fractions, including fractions > 1	Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts
			Simple percentage of an amount	Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison	
			Percentage of an amount – 1%		
			Percentages of an amount		
			Percentages (missing values)	Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts	Multiply one-digit numbers with up to two decimal places by whole numbers
Measurement (approx. 2½ weeks)	**11**	Measure – perimeter, area and volume (11 lessons)	Shapes – same area	Recognise that shapes with the same areas can have different perimeters and vice versa	
			Area and perimeter		
			Area and perimeter – missing lengths		
			Area of a triangle – counting squares	Calculate the area of parallelograms and triangles	
			Area of a right-angled triangle		
			Area of any triangle		
			Area of a parallelogram	Recognise when it is possible to use formulae for area and volume of shapes	Calculate the area of parallelograms and triangles
			Problem solving – area	Calculate the area of parallelograms and triangles	
			Problem solving – perimeter	Recognise that shapes with the same areas can have different perimeters and vice versa	
			Volume – count cubes	Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3]	Recognise when it is possible to use formulae for area and volume of shapes
			Volume of a cuboid		
Summer Term					
Strand	**PM Unit**	**PM Unit Title**	**Lesson**	**NC Objective 1**	**NC Objective 2**
Statistics – (approx. 2½ weeks)	**12**	Statistics (11 lessons)	Interpret line graphs	Interpret and construct pie charts and line graphs and use these to solve problems	
			Draw line graphs		

			Advanced bar charts	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
			Understand and complete pie charts	Interpret and construct pie charts and line graphs and use these to solve problems	
			Read and interpret pie charts		
			Pie charts and fractions (1)		
			Pie charts and fractions (2)		
			Pie charts and percentages		Pupils connect their work on angles, fractions and percentages to the interpretation of pie charts [non-stat]
			Introduction to the mean	Calculate and interpret the mean as an average	
			Calculate the mean		
			Problem solving – mean		
Geometry – (approx. 3½ weeks)	**13**	Properties of Shapes (12 lessons)	Measure and classify angles	Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles	
			Vertically opposite angles		
			Angles in a triangle	Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons	Draw 2D shapes using given dimensions and angles
			Angles in a triangle – missing angles		
			Angles in a triangle – special cases		
			Angles in quadrilaterals		
			Angles in polygons		
			Circles	Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius	
			Parts of a circle		
			Draw shapes accurately	Draw 2D shapes using given dimensions and angles	
			Nets of 3D shapes (1)	Recognise, describe and build simple 3D shapes, including making nets	
			Nets of 3D shapes (2)		
Number – addition, subtraction, multiplication and division (approx. 2 weeks)	**14**	Problem Solving (14 lessons)	Problem solving – place value	Solve number and practical problems that involve all of the above	
			Problem solving – negative numbers		
			Problem solving – addition and subtraction	Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
			Problem solving – four operations (1)	Solve problems involving addition, subtraction, multiplication and division	Use their knowledge of the order of operations to carry out calculations involving the four operations
			Problem solving – four operations (2)		
			Problem solving – fractions	Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts	
			Problem solving – decimals		
			Problem solving – percentages		
			Problem solving – ratio and proportion	Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples	Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
			Problem solving – time (1)	Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places	
			Problem solving – time (2)		
			Problem solving – position and direction	Describe positions on the full coordinate grid (all four quadrants)	
			Problem solving – properties of shapes (1)	Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles	Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
			Problem solving – properties of shapes (2)		