

Mastery Professional Development



Cross-spine segment sequencing

Years 1–6

This document provides a coherent teaching sequence for the Primary Mastery Professional Development materials. For each year group, the document provides a recommended teaching order for segments across the three spines.

Year 1

Number, addition and subtraction	Multiplication and division	Fractions	Comments on sequencing
1.1 Comparison of quantities and measures			
1.2 Introducing 'whole' and 'parts': part-part-whole			
1.3 Composition of numbers: 0-5			
1.4 Composition of numbers: 6-10			
1.5 Additive structures: introduction to aggregation and partitioning			
1.6 Additive structures: introduction to augmentation and reduction			
1.7 Addition and subtraction: strategies within 10			
1.8 Composition of numbers: multiples of 10 up to 100			
1.9 Composition of numbers: 20-100			
1.10 Composition of numbers: 11-19			
	2.1 Counting, unitising and coins		Segment 2.1 includes counting in groups of 2, 5 and 10 (e.g. 5, 10, 15, 20, 25...), so comes after children have learnt about two-digit numbers in segments 1.9 and 1.10.
		<i>It is suggested that all Key Stage 1 fractions content is taught in Year 2.</i>	

Year 2

Number, addition and subtraction	Multiplication and division	Fractions	Comments on sequencing
1.11 Addition and subtraction: bridging 10			Some of the Year 2 content in the National Curriculum (NC) is covered in the suggested segments for Year 1. This is to provide the conceptual basis which children need in order to master the Year 1 NC statements. You may wish to start Year 2 by reviewing learning from segments 1.8–1.10.
1.12 Subtraction as difference			
1.13 Addition and subtraction: two-digit and single-digit numbers			
1.14 Addition and subtraction: two-digit numbers and multiples of ten			
	2.2 Structures: multiplication representing equal groups		Segment 2.2 is sequenced after segment 1.11 which covers adding several addends.
	2.3 Times tables: groups of 2 and commutativity (part 1)		
	2.4 Times tables: groups of 10 and of 5, and factors of 0 or 1		
	2.5 Commutativity (part 2), doubling and halving		
	2.6 Structures: quotitive and partitive division		
1.15 Addition: two-digit and two-digit numbers			It is suggested that there is a gap in the teaching of <i>Spine 1</i> , after adding and subtracting two-digit and single-digit numbers, and two-digit numbers and multiples of ten (segments 1.13 and 1.14), to allow consolidation of these skills and of bridging 10 (segment 1.11) outside of the main maths lesson, before more complex additive calculations are considered from segment 1.15 onwards.

Number, addition and subtraction	Multiplication and division	Fractions	Comments on sequencing
1.16 Subtraction: two-digit and two-digit numbers			
		3.0 Guidance on the teaching of fractions in Key Stage 1	<p>As fractions form such a significant part of the Key Stage 2 curriculum, the Year 3 <i>Mastery Professional Development Materials</i> start from first principles for the teaching and learning of fractions, so that firm foundations can be built for the rest of the primary NC.</p> <p>The guidance notes provided in 3.0 outline a brief teaching progression which will cover the statutory requirements of the National Curriculum in Key Stage 1.</p>
<p>Teaching of the Key Stage 1 curriculum needs to be completed before SATs. This leaves some weeks at the end of Year 2 which can be used to consolidate the year's learning in preparation for Year 3. It is recommended that you focus on securing fluency in addition and subtraction facts, particularly bridging 10 (segment 1.11) so that the children are well prepared for learning column addition and column subtraction in Year 3.</p>			

Year 3

Number, addition and subtraction	Multiplication and division	Fractions	Comments on sequencing
1.17 Composition and calculation: 100 and bridging 100			
1.18 Composition and calculation: three-digit numbers			
1.19 Securing mental strategies: calculation up to 999			
	2.7 Times tables: 2, 4 and 8, and the relationship between them		<p>The conceptual foundations for multiplication and division are introduced in Year 2, and you may wish to review the key concepts of unitising, repeated addition, and equal grouping in segments 2.2–2.6 before starting the Year 3 <i>Spine 2</i> segments.</p> <p>Segments 2.7–2.9 focus on developing conceptual understanding of the times tables. Fluency in times-table facts is also crucial, and regular practice should be undertaken outside the main maths lesson to achieve this. <i>Spine 2</i> segments have been distributed throughout the year, to allow children to achieve fluency in each set of times-tables facts before moving on, and to prepare for the next set of times tables by practising skip counting in the relevant multiples.</p> <p>Note that, for each set of times tables, corresponding division facts and calculations are embedded within each segment.</p>
1.20 Algorithms: column addition			
	2.8 Times tables: 3, 6 and 9, and the relationship between them		

Number, addition and subtraction	Multiplication and division	Fractions	Comments on sequencing
1.21 Algorithms: column subtraction			It is suggested that there is a gap in the teaching of <i>Spine 1</i> , after column addition (segment 1.20) and before column subtraction (segment 1.21), to minimise the chance of children confusing the two algorithms.
		3.1 Preparing for fractions: the part-whole relationship	Continue to develop factual fluency in times tables, in separate sessions, alongside the teaching and learning of these <i>Spine 3</i> segments (3.1–3.4).
		3.2 Unit fractions: identifying, representing and comparing	
		3.3 Non-unit fractions: identifying, representing and comparing	
		3.4 Adding and subtracting within one whole	
	2.9 Times tables: 7 and patterns within/across times tables		Segment 2.9 is sequenced at the end of the year so that children have plenty of opportunity to build fluency in individual times tables before reviewing patterns across times tables.

Year 4

Number, addition and subtraction	Multiplication and division	Fractions	Comments on sequencing
1.22 Composition and calculation: 1,000 and four-digit numbers			
	2.10 Connecting multiplication and division, and the distributive law		
	2.11 Times tables: 11 and 12		Segments 2.10 and 2.11 complete the learning of times tables, which began in Year 2, before moving on to strategies for multiplication and division with larger numbers. Work should continue throughout the year on maintaining fluency in times-tables facts prior to the Year 4 multiplication tables check.
	2.12 Division with remainders		
	2.13 Calculation: multiplying and dividing by 10 or 100		
1.23 Composition and calculation: tenths			
1.24 Composition and calculation: hundredths and thousandths			
1.25 Addition and subtraction: money			
	2.14 Multiplication: partitioning leading to short multiplication		It is suggested that there is a gap in the teaching of <i>Spine 2</i> , before segment 2.14, so that you can ensure that children have the necessary times-table factual fluency to learn and become confident with the short multiplication and division algorithms.
	2.15 Division: partitioning leading to short division		

Number, addition and subtraction	Multiplication and division	Fractions	Comments on sequencing
	2.16 Multiplicative contexts: area and perimeter 1		
		3.5 Working across one whole: improper fractions and mixed numbers	
		3.6 Multiplying whole numbers and fractions	
	2.17 Structures: using measures and comparison to understand scaling		This segment has strong links to segment 3.6, which covers the equivalence of multiplying by a unit fraction and dividing by the denominator. There is some overlap of concepts between these two segments, and teachers may wish to integrate teaching from the two segments.

Year 5

Number, addition and subtraction	Multiplication and division	Fractions	Comments on sequencing
1.26 Composition and calculation: multiples of 1,000 up to 1,000,000			
1.27 Negative numbers: counting, comparing and calculating			
1.28 Common structures and the part-part-whole relationship			
1.29 Using equivalence and the compensation property to calculate			
	2.18 Using equivalence to calculate		Segment 2.18 is sequenced after 1.29 because it uses the same concept of equivalent calculation.
	2.19 Calculation: \times/\div decimal fractions by whole numbers		
	2.20 Multiplication with three factors and volume		
	2.21 Factors, multiples, prime numbers and composite numbers		
	2.22 Combining multiplication with addition and subtraction		
		3.7 Finding equivalent fractions and simplifying fractions	Segment 3.7 is sequenced after 2.21 because it requires children to be confident with the concept of factors.
		3.8 Common denomination: more adding and subtracting	Segment 3.8 is sequenced after 2.21 because it requires children to be confident with the concept of common multiples.

Year 6

Number addition and subtraction	Multiplication and division	Fractions	Comments on sequencing
1.30 Composition and calculation: numbers up to 10,000,000			
	2.23 Multiplication strategies for larger numbers and long multiplication		
	2.24 Division: dividing by two-digit divisors		
	2.25 Using compensation to calculate		
		3.9 Multiplying fractions and dividing fractions by a whole number	The final two <i>Spine 3</i> segments are covered in the first half of the year so that the learning can be applied in other contexts through the year.
		3.10 Linking fractions, decimals and percentages	
	2.26 Mean average and equal shares		
	2.27 Scale factors, ratio and proportional reasoning		
	2.28 Combining division with addition and subtraction		
	2.29 Decimal place-value knowledge, multiplication and division		
	2.30 Multiplicative contexts: area and perimeter 2		
1.31 Problems with two unknowns			