

Mastering Number – Securing Additive Facts in Key Stage 2 - Overview

Teachers and maths leads will need to make informed decisions, based on assessment, about which ‘Blocks’ to use with pupils.

Where materials relate to ready-to-progress criteria from Year 2, teachers should use the materials with those pupils who have not yet secured the relevant criterion.

Assessment could be carried out with small groups or the whole class using assessment sheets, or with individual pupils using flashcards. Teachers should consider the advantages and disadvantages of both ways of assessing pupils; they should ensure that their chosen method allows them to look carefully for pupils who may be using counting strategies rather than quickly recalling facts.

Block	Title and teacher guide	Pupils will:	Links to Ready-to-Progress Criteria	Use this with:	Number of sessions
1	Securing understanding of the additive relationship Teacher Guide Block 1	- Use the language of ‘part’ and ‘whole’ when describing the numbers in a part-part-whole diagram - Secure the language related to addition and subtraction equations: <i>addend</i>; <i>sum</i>; <i>minuend</i>; <i>subtrahend</i>; <i>difference</i> and relate this to the <i>whole</i> and the <i>parts</i> - Write the full set of 8 addition and subtraction equations to match a part-part-whole diagram or bar model - Vary the position of the equals symbol, understanding this as a symbol of <i>equality</i> - Compare part-part-whole diagrams and bar models, understanding that both of these represent the additive relationship between the whole and the parts - Rearrange equations to find missing sums, addends, differences, subtrahends or minuends	3AS-3 Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both these relate to the part-part-whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction.	All pupils in Year 3	12

Block	Title and teacher guide	Pupils will:	Links to Ready-to-Progress Criteria	Use this with:	Number of sessions
2	Composition and securing additive facts: within 5 Teacher Guide Block 2	- Secure their understanding that addition is commutative - Secure their understanding of the composition of 3, 4 and 5, working systematically to find all the ways that these numbers can be composed - Explore the relationship between the addends in a set of facts with the same sum, identifying and explaining the '1 more/1 less' pattern - Apply knowledge of the composition of 3, 4 and 5 to identify when a pair of addends has a given sum - Identify missing addends in addition equations - Identify the difference in subtraction equations, relating this to a missing part/missing addend - Practise recalling addition and subtraction facts within 5 to develop automaticity	2NF-1 Secure fluency in addition and subtraction facts within 10, through continued practice.	Pupils who: - are not yet secure in their understanding that addition is commutative so do not use this to recall facts with addends in either order - do not link their understanding of how numbers can be composed with addition and subtraction facts - cannot yet automatically recall addition and subtraction facts within 5 - revert to counting strategies when finding a sum or difference when adding or subtracting	12
Resources to support whole-class, small-group or individual assessments		NCETM Mastering Number Block 2 Assessment NCETM Mastering Number Year 3 Addition and Subtraction facts within 10 assessment cards (pink flash cards) Baseline Assessment Questions 1, 2 and 3.			

Block	Title and teacher guide	Pupils will:	Links to Ready-to-Progress Criteria	Use this with:	Number of sessions
3	Structures within 10 Teacher Guide Block 3	- Explore the addition table of facts within 10 - Practise recalling previously-learnt facts (within 5) - Identify odd and even numbers - Identify that even numbers can be composed of EITHER a pair of even numbers or a pair of odd numbers and reason that the sum of a pair of odd numbers or a pair of even numbers must be even - Connect the composition of even numbers to doubles - Use knowledge of doubles to subtract when the minuend is double the value of the subtrahend - Identify that odd numbers can be composed of one odd part or one even part, and reason that the sum of an odd or even number must be odd - Identify that the numbers 6 to 9 all have 5 as a part, and connect this to addition and subtraction facts	2NF-1 Secure fluency in addition and subtraction facts within 10, through continued practice.	Pupils who: - are not yet secure in their understanding that 2 odd numbers/ 2 even numbers sum to an even number, and an odd number plus an even number sum to an odd number - cannot yet automatically recall doubles and halves within 10 - do not use knowledge of doubles to subtract when the minuend is double the value of the subtrahend - recall the composition of each of 6, 7, 8, 9 and 10, when 5 is a part, and connect this to related addition and subtraction facts.	10
Resources to support whole-class, small-group or individual assessments		NCETM Mastering Number Block 3 Assessment NCETM Mastering Number Year 3 Addition and Subtraction facts within 10 assessment cards (pink and green flash cards) Baseline Assessment Questions 1, 2 and 4.			

Block	Title and teacher guide	Pupils will:	Links to Ready-to-Progress Criteria	Use this with:	Number of sessions
4	Composition and securing additive facts: 6 to 10 Teacher Guide Block 4	- Explore the addition table of facts within 10 - Secure their understanding of the composition of each of the numbers 6 to 10 - Connect the composition of 6 to 10 with both addition and subtraction facts - Practise recalling sums and differences to develop automaticity within 10 - Apply additive facts within 10 to addition and subtraction calculations to 100, working <i>within</i> 10s boundaries Apply additive facts within 10 to addition and subtraction calculations to 100, working with multiples of 10	2NF-1 Secure fluency in addition and subtraction facts within 10, through continued practice. 2AS-3 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a two-digit number. 3NF-3 Apply place-value knowledge to known additive [and multiplicative] number facts (scaling facts by 10).	Pupils who: - cannot yet automatically recall all 36 addition facts within 10, and their corresponding subtraction facts - cannot confidently apply known facts within 10 to addition and subtraction calculations within 10s boundaries, e.g. $5 + 3 = 8$, so $25 + 3 = 28$, or $8 - 3 = 5$, so $28 - 3 = 25$ - cannot confidently apply known facts within 10 to addition and subtraction calculations within 100 using scaled facts, e.g. $5 + 3 = 8$, so $50 + 30 = 80$, and $80 - 50 = 30$ - Pupils may particularly benefit from using Block 4 if they are not secure with all additive facts with sums or minuends of 6, 7, 8, 9 and 10.	23
Resources to support whole-class, small-group or individual assessments		NCETM Mastering Number Block 4 and 5 Assessment NCETM Mastering Number Year 3 Addition and Subtraction facts within 10 assessment cards (pink, green and blue flash cards) Baseline Assessment Questions 1, 2, 4 and 5.			

Block	Title and teacher guide	Pupils will:	Links to Ready-to-Progress Criteria	Use this with:	Number of sessions
5	Securing additive facts within 10 – strategies Teacher Guide Block 5	- Apply a range of generalisation to secure additive facts within 10, then within 20, including: - adding 1 gives 1 more, subtracting 1 gives 1 less - consecutive numbers have a difference of 1 - adding 2 to an even number gives the next even number - subtracting 2 from an even number gives the previous even number - adding 2 to an odd number gives the next odd number - subtracting 2 from an odd number gives the previous odd number - consecutive even numbers have a difference of 2 - consecutive odd numbers have a difference of 2 - when zero is an addend, the sum is equal to the other addend - when zero is the subtrahend, the difference is equal to the minuend	2NF-1 Secure fluency in addition and subtraction facts within 10, through continued practice.	Pupils who: - cannot yet automatically recall all 36 addition facts within 10, and their corresponding subtraction facts - are not secure with generalisations about adding 1 or 2 to or from odd/even numbers, and differences of 1 or 2, when working within and beyond 10 - are not secure of the impact of adding or subtracting zero	10
Resources to support whole-class, small-group or individual assessments		NCETM Mastering Number Block 4 and 5 Assessment NCETM Mastering Number Year 3 Addition and Subtraction facts within 10 assessment cards (pink, green and blue flash cards) Baseline Assessment Questions 1, 2, 4 and 5.			

Block	Title and teacher guide	Pupils will:	Links to Ready-to-Progress Criteria	Use this with:	Number of sessions
6	Doubles and near doubles across 10 Teacher Guide Block 6	- Explore the addition table of facts across 10 - Secure their understanding of the composition of the numbers 11 to 19 as '10 and a bit' and apply this to addition and subtraction calculations - Use the '5 and a bit' structure to calculate doubles to double 10 - Relate doubles to halves - Practise to develop automaticity with doubles facts, and use these to subtract when the minuend is double the value of the subtrahend - Calculate near doubles by doubling the smaller addend and adding 1 - Calculate near doubles by adding the larger addend and subtracting 1 Transform addition calculations in which the addends are a pair of adjacent odd numbers, or a pair of adjacent even numbers, into a double (e.g. $7 + 5 = 6 + 6$)	3NF-1 Secure fluency in addition and subtraction facts that bridge 10, through continued practice.	All pupils in Year 3.	15
Resources to support whole-class, small-group or individual assessments		NCETM Mastering Number Block 6 Assessment NCETM Mastering Number Year 3 Addition and Subtraction facts through 10 assessment cards (yellow flash cards) Baseline Assessment Questions 3, 4 and 6.			

Block	Title and teacher guide	Pupils will:	Links to Ready-to-Progress Criteria	Use this with:	Number of sessions
7	Addition across 10 Teacher Guide Block 7	- Practise adding three 1-digit numbers when 2 of the addends sum to 10 - Develop fluency with the strategy of 'making 10' for addition calculations across 10 (adding <i>through</i> 10) - Add 5 to each of 6, 7, 8, and 9, by partitioning the larger addend into '5 and a bit' and 'making 10' with $5 + 5$. Consider different addition strategies for the same calculations, e.g. $7 + 5 = 7 + 3 + 2$ (addition <i>through</i> 10) or $7 + 5 = 6 + 6$ (transforming a pair of adjacent odd numbers into a double)	3NF-1 Secure fluency in addition and subtraction facts that bridge 10, through continued practice.	All pupils in Year 3.	12
Resources to support whole-class, small-group or individual assessments		NCETM Mastering Number Block 7 and 8 Assessment NCETM Mastering Number Year 3 Addition and Subtraction facts through 10 assessment cards (yellow, light orange flash cards) Baseline Assessment Questions 3 and 6.			

Block	Title and teacher guide	Pupils will:	Links to Ready-to-Progress Criteria	Use this with:	Number of sessions
8	Subtraction across 10 Teacher Guide Block 8 (part 1) Block 8 (part 2)	- Identify the subtraction facts which relate to addition facts across 10 - Subtract by identifying missing addends - Develop fluency with the strategy of 'subtracting <i>through</i> 10' by partitioning the <i>subtrahend</i> into two parts and bridging back through 10 - Develop fluency with the strategy of 'subtracting <i>from</i> 10' by partitioning the <i>minuend</i> into 10 and a bit and subtracting from 10 - Check subtraction calculations by applying understanding of the additive relationship (checking that the sum of the subtrahend and difference is equal to the minuend) - Compare different subtraction strategies and consider which may be more efficient given the numbers in a calculation Use knowledge of doubles to subtract when the minuend is double the value of the subtrahend	3NF-1 Secure fluency in addition and subtraction facts that bridge 10, through continued practice.	All pupils in Year 3.	15
Resources to support whole-class, small-group or individual assessments		NCETM Mastering Number Block 7 and 8 Assessment NCETM Mastering Number Year 3 Addition and Subtraction facts through 10 assessment cards (yellow, dark orange flash cards) Baseline Assessment Questions 3 and 6.			