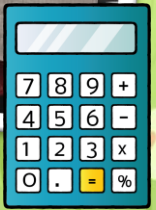




Newbald Primary School



Maths Key Calculation Methods





Newbald Primary School Maths Key Calculation Methods

- This document sets out the key mathematical calculation methods that Newbald Primary School has identified as essential for pupils to secure as they progress through the school. These methods represent the strategies that we prioritise in teaching, explicitly assess, and provide targeted intervention for where needed, to ensure all pupils remain on track to make excellent progress in mathematics.
- This policy should be read in conjunction with the school's adopted White Rose Calculation Policy and our bespoke KIRFs (Key Instant Recall Facts) document, which identifies the key mathematical facts pupils are expected to learn and recall securely at each stage. Together, these documents provide a coherent and consistent approach to the teaching and learning of calculation at Newbald Primary School.
- This policy outlines the key calculation methods and the expected stages at which pupils will have secured each strategy, enabling them to meet or exceed age related expectations. Teachers are expected to assess pupils' use of these methods and record outcomes on the school's Insight tracking system.





Newbald Primary School Maths Key Calculation Methods



- Where assessment indicates that a pupil is not on track to secure an identified method, teachers are expected to put timely and appropriate intervention in place. As these methods have been identified as key, any gaps in learning will be addressed promptly so that pupils are well prepared to build on prior understanding and access new learning with confidence.
- The focus of this document is on pupils' conceptual understanding and their ability to apply methods, rather than the rote recall of procedures. Assessment is therefore based on the skill a pupil demonstrates when selecting and using an appropriate method accurately and efficiently.
- The progression of calculation methods follows a Concrete, Pictorial, Abstract (CPA) approach. Pupils begin by using physical resources, move on to visual representations such as drawings and number lines, and finally apply their understanding using abstract symbols and written methods. This progression ensures that pupils develop a secure understanding of the mathematical concepts underpinning each calculation before moving on to more formal and efficient approaches.
- This document outlines the progression of key calculation methods, from early counting and informal strategies through to formal written methods, ensuring clarity and consistency for all those supporting pupils' mathematical development.



Progression of key skills - Addition

Year group	Key Skills & Methods
Nursery	•Subitise to 3 •Count how many - touch correspondence eg touch one at a time and say number •Make numbers to 5 •Add 1 more (through songs and rhymes) •Can use physical objects (fingers, counters, beads) to represent both numbers, then combining and counting them all. •Can use fingers to represent an amount or number •Can count to ten from 0 using fingers in a systematic way
Reception	•Conceptually subitise to 5 •1 more •Notice the composition of numbers within 10 •Combine 2 groups - touch correspondence eg touch one at a time and say number •Add more •Can use physical objects (fingers, counters, beads) to represent both numbers, then combining and counting them all. •Can use fingers to represent an amount or number •Can count to ten using fingers in a systematic way
Year 1	•Bonds within 10 using method of starting with larger number in a set and counting on the smaller amount eg using fingers) •Related facts within 20 using method of starting with larger number in a set and counting on the smaller amount eg using fingers) •Related facts within 20 Using a numbered track or number line to add and make jumps of differing amounts
Year 2	•Add two 2-digit numbers (not across a ten) using a partitioning method ($31 + 27 = 30 + 20$ & $1 + 7 = 50 + 8 = 58$) •Add two 2-digit numbers (across a ten) using a partitioning method ($35 + 27 = 30 + 20$ & $5 + 7 = 50 + 12 = 62$) •Add two 2-digit numbers (across a ten) Using an empty number track or number line to add and make jumps of differing amounts to assist when adding increasingly larger numbers
Year 3	•Add two numbers (no exchange) - Using a column method 3 digits •Add two numbers across a 10 or 100 (with exchange) - Using a column method 3 digits
Year 4	•Add two 4-digit numbers (across a 10 or 100 or 1000) using a column method 4 digits
Year 5	•Add numbers with more than 4 digits (including exchange) using a column method •Add decimals with up to 2 decimal places Using a column method
Year 6	•Add decimals with up to 3 decimal places using a column method •Add 3 or more numbers using a column method of varying digits and decimals using a column method



Progression of key skills - Subtraction



Year group	Key Skills & Methods
Nursery	•Subitise to 3 •Count how many •Make numbers to 5 •Take 1 away (through songs and rhymes) •Can physically remove objects (fingers, counters, beads) from a group and count how many remain •Can use fingers to represent an amount or number (see addition) •Can count from ten to 0 using fingers in a systematic way
Reception	•Conceptually subitise to 5 •1 less •Notice the composition of numbers within 10 •Partition •Take away •Can physically remove objects (fingers, counters, beads) from a group and count how many remain •Can use fingers to represent an amount or number (see addition) •Can count from ten to 0 using fingers in a systematic way
Year 1	•Bonds within 10 using method of counting backwards using fingers •Bonds within 10 using method of counting the difference starting with the smaller number and counting to the larger to find the difference using fingers •Related facts within 20 using method of counting the difference starting with the smaller number and counting to the larger to find the difference using fingers •Related facts within 20 Using a numbered track or number line to subtract and make jumps of differing amounts
Year 2	•Subtract two 2-digit numbers (not across a ten) using method of subtracting tens and ones separately (89-57 becomes 80 - 50 and 9 - 7 = 32) •Subtract two 2-digit numbers (across a ten) - Recognising that digits cannot be swapped and a different method is needed eg not to use above method eg: 52 - 38 •Subtract two 2-digit numbers (across a ten) Using an empty number track or number line to add and make jumps of differing amounts to assist when adding increasingly larger numbers
Year 3	•Subtract two numbers (no exchange) - Using a column method 3 digits •Subtract two numbers across a 10 or 100 (with exchange) - Using a column method 3 digits
Year 4	•Subtract two 4-digit numbers (across a 10 or 100 or 1000) using a column method 4 digits (including exchanging) •Subtract two 4-digit numbers (across a 10 or 100 or 1000) using a column method where 0 is a place holder
Year 5	•Subtract numbers with more than 4 digits (including exchange) using a column method (including varying digits and exchanging) •Subtract decimals with up to 2 decimal places Using a column method (including varying digits and exchanging)
Year 6	•Subtract decimals with up to 3 decimal places using a column method - (including varying digits and exchanging)



Progression of key skills - Multiplication

Year group	Key Skills & Methods
Nursery	•Continue with counting and subitising skills as a foundation for later work on equal groups. (see addition and subtraction sections) •Can physically make equal groups of counters, beads etc
Reception	•Double to 10 •Make equal groups •Can physically make equal groups of counters, beads etc
Year 1	•Add equal groups - repeated addition using physical or pictures •Make arrays - using physical items to derive fact •Use fingers to count in multiples of 2, 5 and 10 - KIRF link
Year 2	•Link repeated addition and multiplication ie know lots of 3×5 is three lots of $5 = 5 + 5 + 5 = 15$ •Use arrays - drawn by hand to derive fact •Double - Know this is number + number eg double 6 = $6 + 6$ •Use fingers to count in multiples of 2, 5 and 10 and use fingers to derive multiple e.g. what is 8 times 2 and count to 8th finger - KIRF link
Year 3	•Use fingers to count in multiples of 3, 4 and 8 and use fingers to derive multiple e.g. what is 4 times 8 and count to 4th finger - KIRF link •Related facts - know if $3 \times 7 = 21$ then 7×3 must also be 21 •Multiply a 2-digit number by a 1-digit number - no exchange $21 \times 4 = 20 \times 4$ and $1 \times 4 = 80 + 4 = 84$ •Multiply a 2-digit number by a 1-digit number - with exchange $45 \times 3 = 40 \times 3$ and $5 \times 3 = 120 + 15 = 135$
Year 4	•Multiply a 2 or 3-digit number by a 1-digit number - short method which can be in the expanded form
Year 5	•Multiply numbers up to 4 digits by a 1-digit number - short written method •Multiply numbers up to 4 digits by a 2-digit number - short written method
Year 6	•Multiply numbers up to 4 digits by a 2-digit number - written method •Multiply decimals by integers - written method



Progression of key skills - Division



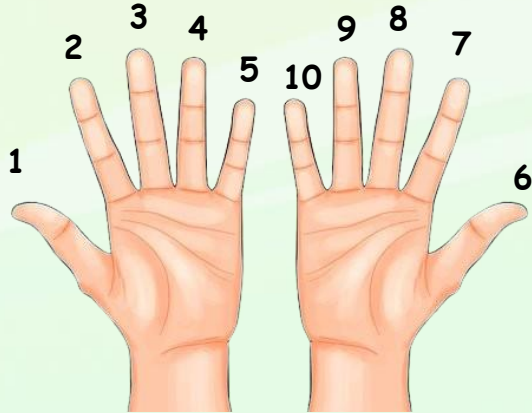
Year group	Key Skills & Methods
Nursery	•Continue with counting and subitising skills as a foundation for later work on equal groups. (see addition and subtraction sections) •Can physically make equal groups of counters, beads from a given amount etc •Can physically share counters, beads etc into groups
Reception	•Sharing •Grouping •Can physically make equal groups of counters, beads from a given amount etc •Can physically share counters, beads etc into groups
Year 1	•Make equal groups - grouping - Using pictures or using physical items to derive fact •Make equal groups - sharing - Using physical items to derive fact •Find a half - by splitting items into 2 groups (physically) •Find a quarter - by splitting items into 4 (physically) - or half and half again
Year 2	•Use fingers to count in multiples of 2, 5 and 10 and use fingers to derive fact e.g. what is 16 divided by 2 and count to 16 in 2s using fingers and count how many fingers = 8 KIRF link •Use arrays - drawn by hand to derive fact - grouping and sharing by drawing
Year 3	•Divide a 2-digit number by a 1-digit number - no exchange - Use fingers to count in multiples of 3, 4 and 8 and use fingers to derive fact e.g. what is 32 divided by 4 and count to 32 in 4s using fingers and count how many fingers = 8 KIRF link
Year 4	•Divide a 2-digit number by a 1-digit number - with remainders Use fingers to count in multiples of 3, 4 and 8 and use fingers to derive fact e.g. what is 34 divided by 4 and count to nearest multiple below = 32 in 4s using fingers and count how many fingers = 8 then count how many left over 2 so 8r2 - use jottings to assist (can include number line use)
Year 5	•Divide numbers up to 4 digits by a 1-digit number - short written method
Year 6	•Short division - short written method including remainders & expressing as decimals •Divide decimals by integers - Short written method - give answer as decimal •Divide by a non-prime 2 digit number using factor pairs



Counting on fingers guidance

Research informed evidence suggests that those pupils who learnt to count confidently and systematically using their fingers out perform those who did not. (The British psychological society & EEF research). We take a systematic and consistent approach to teaching our pupils to use fingers to assist in their mathematics.

Palms should be facing pupil.



Left hand for 1-5. Counting starts using the thumb



Left and right hands for 6 - 10





Newbald Primary School Maths Key Calculation Methods



Addition



Nursery: Addition



Nursery

- Begin to have an understanding of numbers to 5
- We recommend focusing on noticing and representing small quantities, perceptual subitising and counting.

• Subitise to 3

• Count how many - touch correspondence eg touch one at a time and say number

• Make numbers to 5

• Add 1 more (through songs and rhymes)

• Can use physical objects (fingers, counters, beads) to represent both numbers, then combining and counting them all.

• Can use fingers to represent an amount or number

• Can count to ten from 0 using fingers in a systematic way

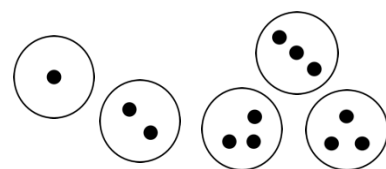
Progression of skills

Key representations

Subitise to 3

Instantly see how many.

How many do you see?



Count how many

Begin to count objects using 1-1 correspondence.

How many are there?

3

5

Count out ... from a larger group.

E.g. Collect 3 beanbags for a game.



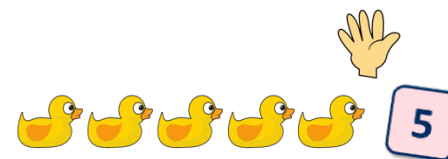
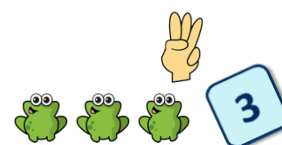
Make numbers to 5

Start by showing 1, 2 and 3 using fingers.

Show me...



Begin to link numerals to quantities.



Add 1 more

Through stories, songs and rhymes.

How many do I have now?





Reception: Addition

Reception

- Have a deep understanding of numbers to 10, including the composition of each number.
- Subitise (recognise quantities without counting) up to 5
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double facts.

- Conceptually subitise to 5
- 1 more
- Notice the composition of numbers within 10
- Combine 2 groups - touch correspondence eg touch one at a time and say number
- Add more
- Can use physical objects (fingers, counters, beads) to represent both numbers, then combining and counting them all.
- Can use fingers to represent an amount or number
- Can count to ten using fingers in a systematic way

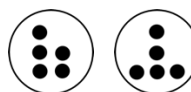
Progression of skills

Key representations

Conceptually subitise to 5

Notice the parts that make up the whole.

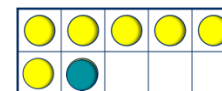
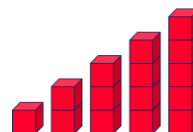
What do you see?
How do you see it?



1 more

Continue to link to stories, songs and rhymes.

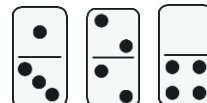
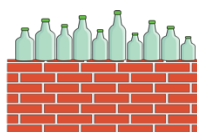
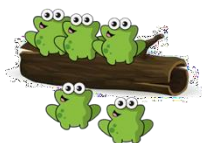
1 more than ... is ...



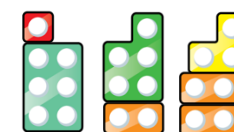
Notice the composition of numbers within 10

Link to stories, songs and rhymes.

How many...?
How many...?
How many altogether?



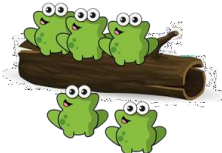
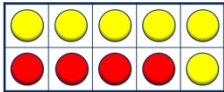
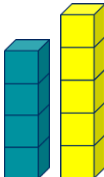
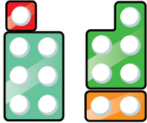
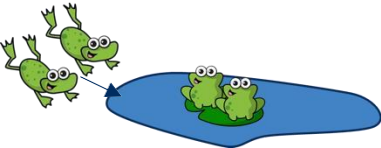
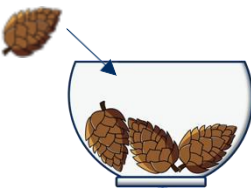
How many ways can you make...?





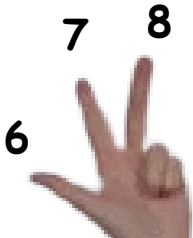
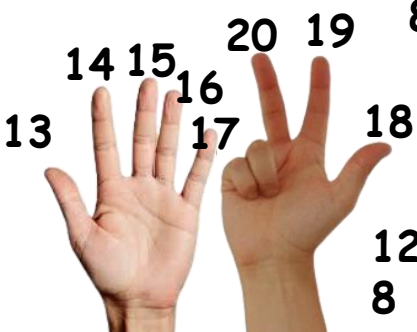
Reception: Addition (continued)



Progression of skills	Key representations	
Combine 2 groups 2 groups are combined to find the total.	There are There are There are altogether.   	 and make    
Add more A quantity is increased.	First... Then.... Now....   	I have I add more. Now I have....   

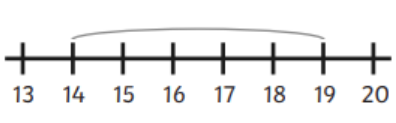


Year 1: Addition

Year 1	•Bonds within 10 using method of starting with larger number in a set and counting on the smaller amount eg using fingers) •Related facts within 20 using method of starting with larger number in a set and counting on the smaller amount eg using fingers) •Related facts within 20 Using a numbered track or number line to add and make jumps of differing amounts	
Key Methods	Examples and guidance	
•Bonds within 10 using method of starting with larger number in a set and counting on the smaller amount e.g. using fingers)	$3 + 5 =$  $3 + 5 = 8$	$2 + 8 =$  $8 + 2 = 10$
•Related facts within 20 using method of starting with larger number in a set and counting on the smaller amount eg using fingers)	$3 + 15 =$  $3 + 15 = 18$ $15 + 3 = 18$	$8 + 12 =$  $12 + 8 = 20$ $8 + 12 = 20$



Year 1: Addition Continued

Key Methods	Examples and guidance	
•Related facts within 20 Using a numbered track or number line to add and make jumps of differing amounts	$14 + 5 = 19$ 	2 more than 5 is 7   2 more than 15 is 17



Year 2: Addition



Year 2	•Add two 2-digit numbers (not across a ten) using a partitioning method ($31 + 27 = 30+20$ & $1 + 7 = 50 + 8 = 58$) •Add two 2-digit numbers (across a ten) using a partitioning method ($35 + 27 = 30+20$ & $5 + 7 = 50 + 12 = 62$) •Add two 2-digit numbers (across a ten) Using an empty number track or number line to add and make jumps of differing amounts to assist when adding increasingly larger numbers	
Key Methods	Examples and guidance	
•Add two 2-digit numbers (not across a ten) using a partitioning method ($31 + 27 = 30+20$ & $1 + 7 = 50 + 8 = 58$)	$23 + 41 =$ 23 20 3 41 40 1 $20 + 40 = 60$ $3 + 1 = 4$ $60 + 4 = 64$ so $23 + 41 = 64$	$42 + 17 =$ $40 + 10 = 50$ $2 + 7 = 9$ $50 + 9 = 59$ $42 + 17 = 59$
•Add two 2-digit numbers (across a ten) using a partitioning method ($35 + 27 = 30+20$ & $5 + 7 = 50 + 12 = 62$)	$29 + 43 =$ 29 20 9 43 40 3 $20 + 40 = 60$ $9 + 3 = 12$ $60 + 12 = 72$ so $29 + 43 = 72$	$48 + 19 =$ $40 + 10 = 50$ $8 + 9 = 17$ $50 + 17 = 67$ $48 + 19 = 67$



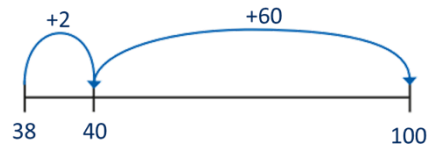
Year 2: Addition Continued

Key Methods

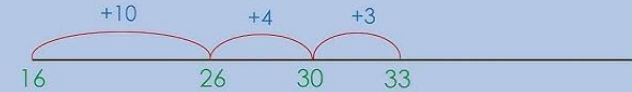
•Add two 2-digit numbers (across a ten)
Using an empty number track or number line to add and make jumps of differing amounts to assist when adding increasingly larger numbers

Examples and guidance

$$38 + 62 = 100$$

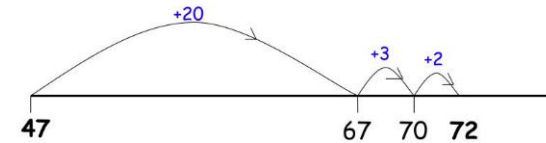


$$16 + 17 = 33$$



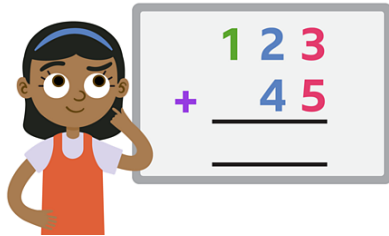
$$25 + 47 = \square$$

Use the counting up method!!





Year 3: Addition

Year 3	•Add two numbers (no exchange) - Using a column method 3 digits •Add two numbers across a 10 or 100 (with exchange) - Using a column method 3 digits																																																													
Key Methods	Examples and guidance																																																													
•Add two numbers (no exchange) - Using a column method 3 digits	<table><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td></td><td>3</td><td>4</td><td>5</td></tr><tr><td></td><td>+</td><td>4</td><td>3</td><td>2</td></tr><tr><td></td><td></td><td colspan="3"> </td></tr><tr><td></td><td></td><td colspan="3"> </td></tr></table> <table><tr><td></td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td>6</td><td>2</td><td>3</td></tr><tr><td>+</td><td>2</td><td>1</td><td>5</td></tr><tr><td></td><td colspan="3"> </td></tr><tr><td></td><td>8</td><td>3</td><td>8</td></tr></table>								H	T	O			3	4	5		+	4	3	2												H	T	O		6	2	3	+	2	1	5						8	3	8											
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		H	T	O																																																										
		2	5	5																																																										
	+		5	4																																																										
		H	T	O																																																										
		3	6	7																																																										
	+	1	6	4																																																										
		5	3	1																																																										



Year 4: Addition

Year 4

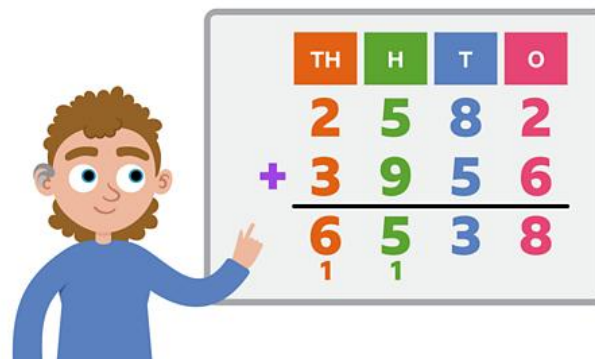
•Add two 4-digit numbers (across a 10 or 100 or 1000) using a column method 4 digits

Key Methods

Examples and guidance

•Add two 4-digit numbers (across a 10 or 100 or 1000) using a column method 4 digits

	Th	H	T	O
	4	6	7	3
+	1	5	1	8
	6	1	9	1
	1		1	



TH	H	T	O	
2	5	8	2	
+	3	9	5	6
6	5	3	8	
1	1			



TH	H	T	O	
2	4	7	5	
+	2	9	1	3

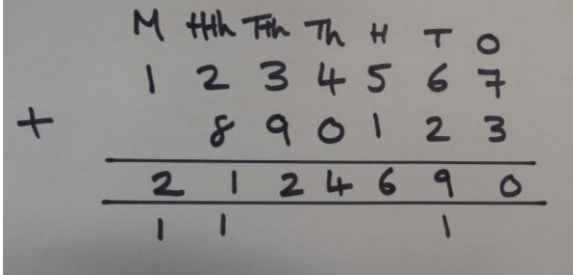
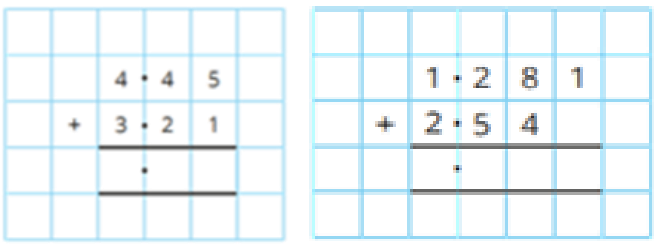
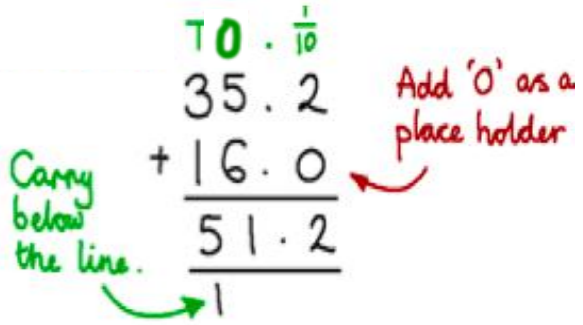
TH	H	T	O
4	3	2	5
+	9	6	2

TH	H	T	O	
5	0	7	5	
+	2	9	2	4

TH	H	T	O	
	8	2	9	
+	4	9	2	5

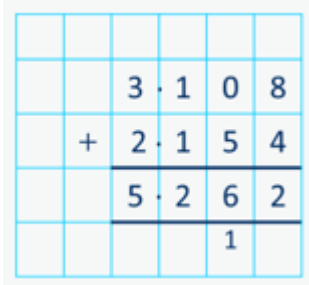
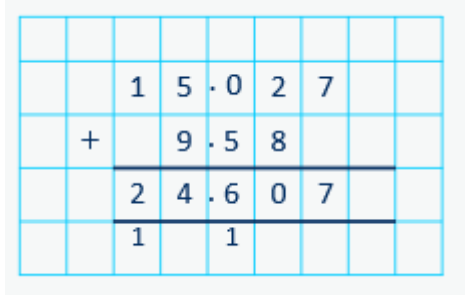
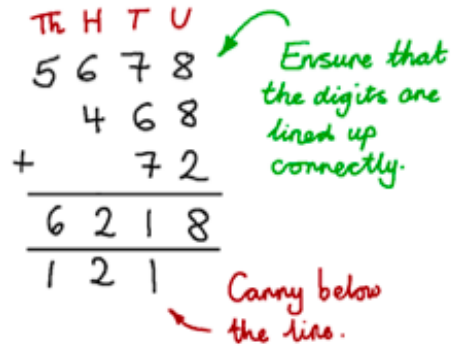


Year 5: Addition

Year 5	•Add numbers with more than 4 digits (including exchange) using a column method •Add decimals with up to 2 decimal places Using a column method	
Key Methods	Examples and guidance	
•Add numbers with more than 4 digits (including exchange) using a column method		
•Add decimals with up to 2 decimal places Using a column method		



Year 6: Addition

Year 6	•Add decimals with up to 3 decimal places using a column method •Add 3 or more numbers using a column method of varying digits and decimals using a column method	
Key Methods	Examples and guidance	
•Add decimals with up to 3 decimal places using a column method		
•Add 3 or more numbers using a column method of varying digits and decimals using a column method		



Newbald Primary School Maths Key Calculation Methods



Subtraction



Nursery: Subtraction



Nursery

- Begin to have an understanding of numbers to 5
- We recommend focusing on noticing and representing small quantities, perceptual subitising and counting.

- Subitise to 3
- Count how many
- Make numbers to 5
- Take 1 away (through songs and rhymes)
- Can physically remove objects (fingers, counters, beads) from a group and count how many remain
- Can use fingers to represent an amount or number (see addition)
- Can count from ten to 0 using fingers in a systematic way

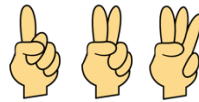
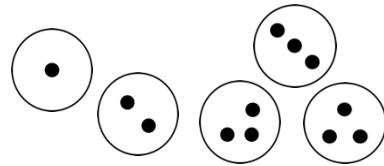
Progression of skills

Key representations

Subitise to 3

Instantly see how many.

How many do you see?



Count how many

Begin to count objects using 1-1 correspondence.

How many are there?



Count out ... from a larger group.

E.g. Collect a cup for everyone at the table.



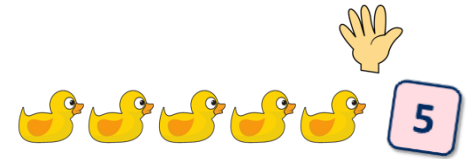
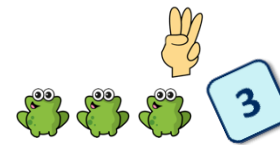
Make numbers to 5

Start by showing 1, 2 and 3 using fingers.

Show me...



Begin to link numerals to quantities.



Take 1 away

Through stories, songs and rhymes.

How many do we have now?





Reception: Subtraction

Reception

- Have a deep understanding of number to 10, including the composition of each number.
- Subitise (recognise quantities without counting) up to 5
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (and some subtraction facts) and some number bonds to 10, including double facts.

•Conceptually subitise to 5

•1 less

•Notice the composition of numbers within 10

•Partition

•Take away

•Can physically remove objects (fingers, counters, beads) from a group and count how many remain

•Can use fingers to represent an amount or number (see addition)

•Can count from ten to 0 using fingers in a systematic way

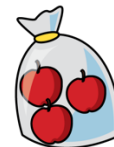
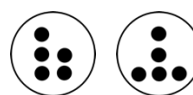
Progression of skills

Key representations

Conceptually subitise to 5

Notice the parts that make up the whole.

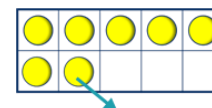
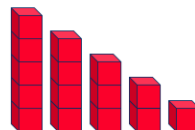
What do you see?
How do you see it?



1 less

Continue to link to stories, songs and rhymes.

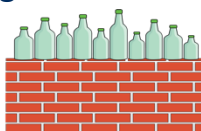
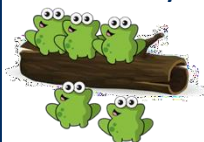
1 less than ... is ...



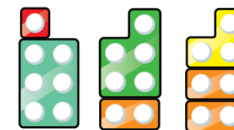
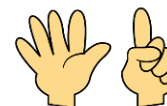
Notice the composition of numbers within 10

Link to stories, songs and rhymes.

How many...?
How many...?
How many altogether?



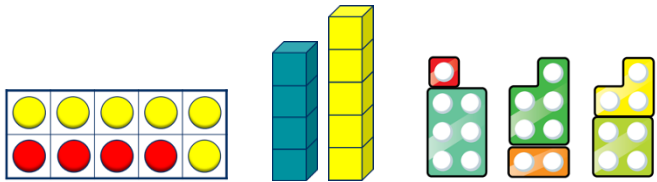
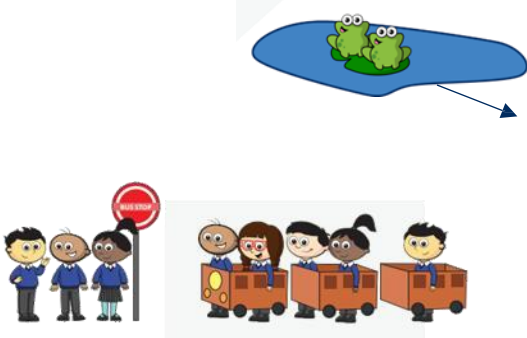
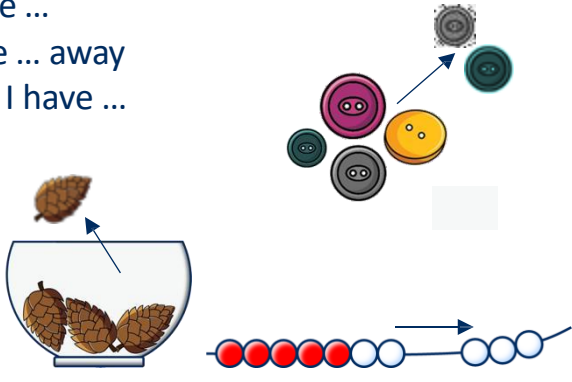
How many ways can you make...?





Reception: Subtraction Continued

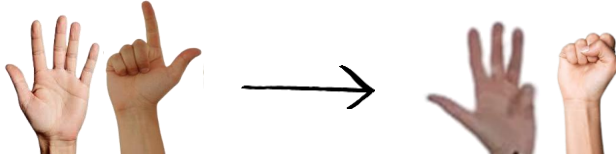


Progression of skills	Key representations	
Partition Using objects, explore different ways to partition a number into 2 or more parts.	There are ... altogether. I can see ... here and ... there. 	... and ... make ... 
Take away A quantity is reduced.	First... Then... Now... 	I have ... I take ... away Now I have ... 



Year 1: Subtraction



Year 1	• Bonds within 10 using method of counting backwards using fingers • Bonds within 10 using method of counting the difference starting with the smaller number and counting to the larger to find the difference using fingers • Related facts within 20 using method of counting the difference starting with the smaller number and counting to the larger to find the difference using fingers • Related facts within 20 Using a numbered track or number line to subtract and make jumps of differing amounts	
Key Methods	Examples and guidance	
• Bonds within 10 using method of counting backwards using fingers	$7 - 3 =$  $7 - 3 = 4$	• Start by showing total amount on fingers • Put down (in order) number taken away • Count (or recognise) how many remaining to complete calculation
• Bonds within 10 using method of counting the difference starting with the smaller number and counting to the larger to find the difference using fingers	Find the difference: $7 - 3 =$ 5 6 7 4  So $7 - 3 = 4$	• Identify smaller number • Count on from the smaller number to the target number • Count how many fingers (the difference) to complete the calculation



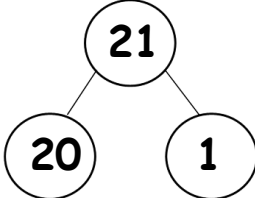
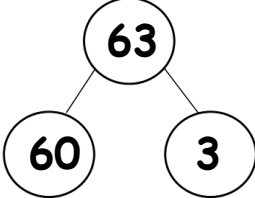
Year 1: Subtraction Continued



Key Methods	Examples and guidance	
• Related facts within 20 using method of counting the difference starting with the smaller number and counting to the larger to find the difference using fingers	Find the difference: $17 - 9 =$ So $17 - 9 = 8$ • Identify smaller number • Count on from the smaller number to the target number • Remember to stop at target number! • Count how many fingers (the difference) to complete the calculation • Number may be more than 10 • Pupil to remember counting beyond 10 e.g. $19 - 6 = 13$	
• Related facts within 20 Using a numbered track or number line to subtract and make jumps of differing amounts	Using a number line to assist counting backwards (take away, less than) $8 - 3 = 5$ $18 - 3 = 15$ In this example the pupil moves backwards on the number line	Using a number line to assist finding the difference $7 - 5 = 2$ $27 - 25 = 2$ In this example the pupil moves and counts forwards on the number line The pupil counts the jumps to



Year 2: Subtraction

Year 2	•Subtract two 2-digit numbers (not across a ten) using method of subtracting tens and ones separately (89-57 becomes 80 - 50 and 9 - 7 = 32) •Subtract two 2-digit numbers (across a ten) - Recognising that digits cannot be swapped and a different method is needed eg not to use above method eg: 52 - 38 •Subtract two 2-digit numbers (across a ten) Using an empty number track or number line to add and make jumps of differing amounts to assist when adding increasingly larger numbers	
Key Methods	Examples and guidance	
•Subtract two 2-digit numbers (not across a ten) using method of subtracting tens and ones separately (89-57 becomes 80 - 50 and 9 - 7 = 32)	89-57 becomes: 80 - 50 = 30 And 9 - 7 = 2 So 89 - 57 = 32)	63 - 21 =  60 - 20 = 40 3 - 1 = 2 63 - 21 = 42
•Subtract two 2-digit numbers (across a ten) - Recognising that digits cannot be swapped and a different method is needed eg not to use above method eg: 52 - 38	In doing the above methods pupils must know never swap digits round in the calculation. This is a key skill	



Year 2: Subtraction Continued

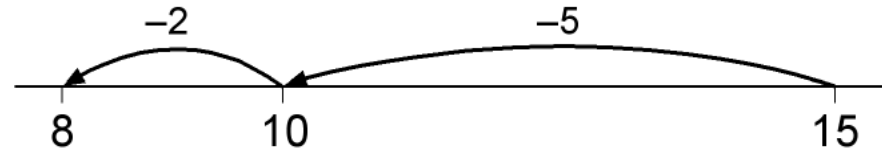
Key Methods

•Subtract two 2-digit numbers (across a ten)
Using an empty number track or number line to add and make jumps of differing amounts to assist when adding increasingly larger numbers

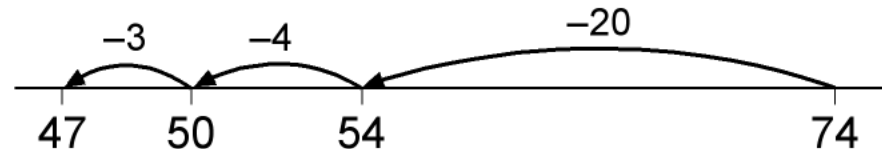
Examples and guidance

Using a number line to assist counting backwards (take away, less than)

$$15 - 7 = 8$$



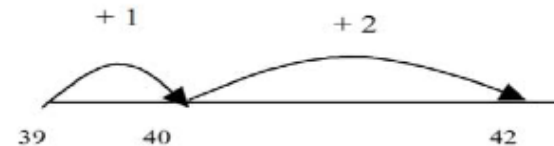
$$74 - 27 = 47$$



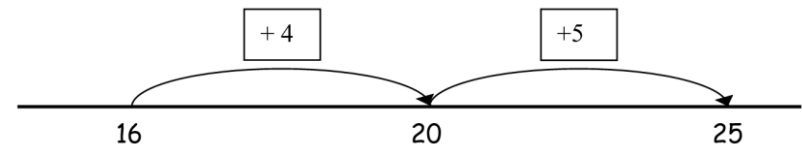
In this example the pupil moves backwards on the number line

Using a number line to assist finding the difference

$$42 - 39 = 3$$



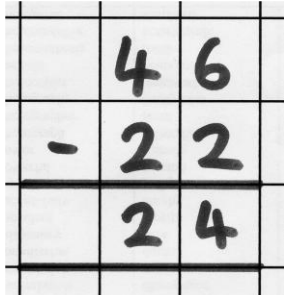
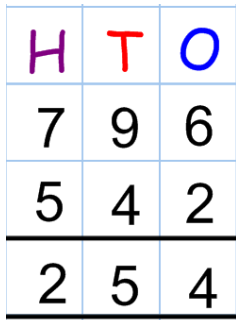
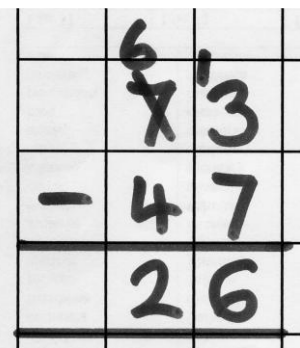
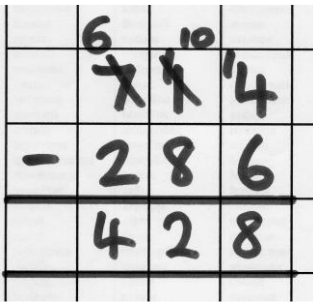
$$25 - 16 = 9$$



In this example the pupil moves and counts forwards on the number line
The pupil counts the jumps to



Year 3: Subtraction =

Year 3	•Subtract two numbers (no exchange) - Using a column method 3 digits •Subtract two numbers across a 10 or 100 (with exchange) - Using a column method 3 digits		
Key Methods	Examples and guidance		
•Subtract two numbers (no exchange) - Using a column method 3 digits			 Pupils to know to start from the right-hand side Pupils should not swap order of digits
	•Subtract two numbers across a 10 or 100 (with exchange) - Using a column method 3 digits		



Year 4: Subtraction

Year 4

- Subtract two 4-digit numbers (across a 10 or 100 or 1000) using a column method 4 digits (including exchanging)
- Subtract two 4-digit numbers (across a 10 or 100 or 1000) using a column method where 0 is a place holder

Key Methods

Examples and guidance

• Subtract two 4-digit numbers (across a 10 or 100 or 1000) using a column method 4 digits (including exchanging)

	Th	H	T	O
	3	¹² 2	⁹ 0	16
-	2	1	4	8
	1	0	5	8

	TH	H	T	O
	³ 4	¹² 3	¹ 2	8
-	1	4	3	6
	2	8	9	2

	Th	H	T	O
	8	9	3	2
-	4	1	5	7

• Subtract two 4-digit numbers (across a 10 or 100 or 1000) using a column method where 0 is a place holder

	H	T	O
	⁵ 6	⁹ 0	¹ 8
-	2	4	9
	3	5	9

	4	6	0	2
-	1	3	4	9
	3	2	5	3



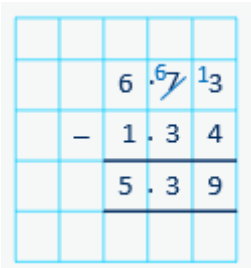
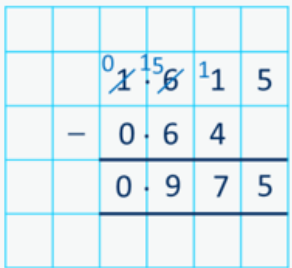
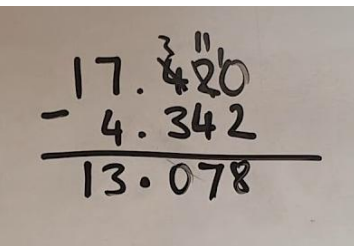
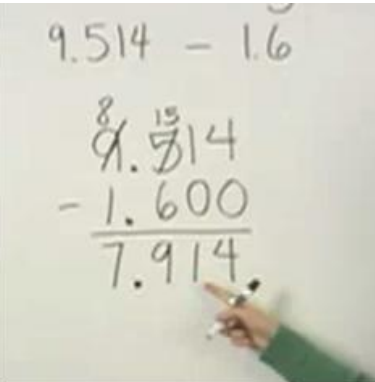
Year 5: Subtraction

Year 5	•Subtract numbers with more than 4 digits (including exchange) using a column method (including varying digits and exchanging) •Subtract decimals with up to 2 decimal places Using a column method (including varying digits and exchanging)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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•Subtract numbers with more than 4 digits (including exchange) using a column method (including varying digits and 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Year 6: Subtraction



Year 6	•Subtract decimals with up to 3 decimal places using a column method - (including varying digits and exchanging)
Key Methods	Examples and guidance
•Subtract decimals with up to 3 decimal places using a column method - (including varying digits and exchanging)	   



Newbald Primary School Maths Key Calculation Methods



Multiplication



Nursery: Multiplication

Nursery

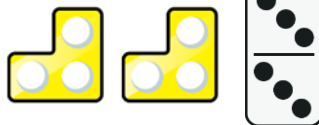
- Continue with counting and subitising skills as a foundation for later work on equal groups. (see addition and subtraction sections)

- Continue with counting and subitising skills as a foundation for later work on equal groups. (see addition and subtraction sections)
- Can physically make equal groups of counters, beads etc

Progression of skills

Key representations

Can physically make equal groups of counters, beads etc





Reception: Multiplication

Reception

- Have a deep understanding of number to 10, including the composition of each number.
- Subitise (recognise quantities without counting) up to 5
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double facts.
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

•Double to 10

•Make equal groups

•Can physically make equal groups of counters, beads etc

Progression of skills

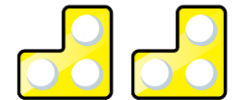
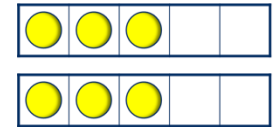
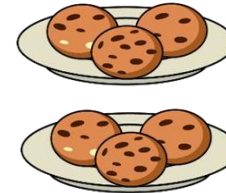
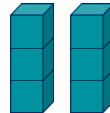
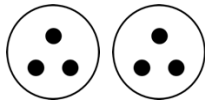
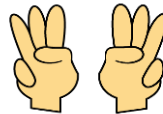
Double to 10

Prompt children to notice that double means twice as many and to notice that there are two equal groups.

Key representations

Double ... is ...

... is double ...



Make equal groups

Provide opportunities to make equal groups when tidying up or during snack time. Encourage children to check that each group has the same amount.

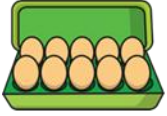
There are ... groups of ...

There are ... altogether.





Year 1: Multiplication

Year 1	•Add equal groups - repeated addition using physical or pictures •Make arrays - using physical items to derive fact •Use fingers to count in multiples of 2, 5 and 10
Key Methods	Examples and guidance
•Add equal groups - repeated addition using physical or pictures	 $10 + 10 + 10 = 30$  $5 + 5 + 5 + 5 = 20$  $3 + 3 + 3 + 3 = 12$ So 4 lots of 3 = 12 Or 4 groups of 3 = 12
•Make arrays - using physical items to derive fact	There are ... rows of ... There are ... altogether. There are ... columns of ... There are ... altogether 



Year 2: Multiplication

Year 2

- Link repeated addition and multiplication ie know lots of 3×5 is three lots of $5 = 5 + 5 + 5 = 15$
- Use arrays - drawn by hand to derive fact
- Double - Know this is number + number eg double $6 = 6 + 6$
- Use fingers to count in multiples of 2, 5 and 10 and use fingers to derive multiple e.g. what is 8 times 2 and count to 8th finger - KIRF link

Key Methods

Examples and guidance

•Link repeated addition and multiplication ie know lots of 3×5 is three lots of $5 = 5 + 5 + 5 = 15$

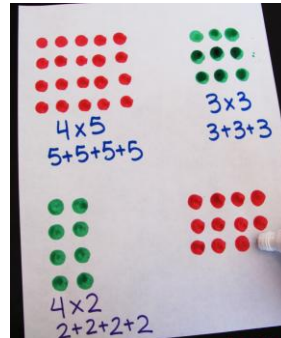


$$\begin{aligned}
 3 + 3 &= 6 \\
 2 \text{ lots of } 3 &= 6 \\
 2 \text{ groups of } 3 &= 6 \\
 2 \times 3 &= 6
 \end{aligned}$$



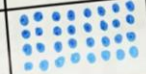
$$\begin{aligned}
 5 + 5 + 5 &= 15 \\
 3 + 3 + 3 + 3 + 3 &= 15 \\
 3 \times 5 &= 15 \\
 5 \times 3 &= 15
 \end{aligned}$$

•Use arrays - drawn by hand to derive fact



Directions: Finish the chart below by drawing

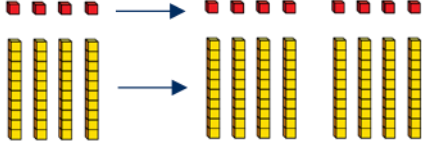
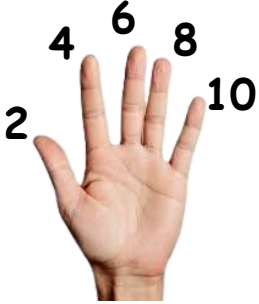
Multiplication Problem	Array	Repeated Addition
5×2		$2 + 2 + 2 + 2 + 2$
3×7		$7 + 7 + 7$
4×6		$6 + 6 + 6 + 6$

4×4		$4 + 4 + 4 + 4$
2×9		$9 + 9$
4×8		$8 + 8 + 8 + 8$



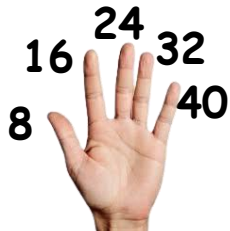
Year 2: Multiplication Continued



Key Methods	Examples and guidance
• Double - Know this is number + number eg double 6 = 6 + 6	 Double 4 = 4 + 4 Double 4 is 8  Double 4 is 8 So Double 40 is 80 Double 3 = 3 + 3 Double 12 = 12 + 12 Double 100 = 100 + 100
• Use fingers to count in multiples of 2, 5 and 10 and use fingers to derive multiple e.g. what is 8 times 2 and count to 8th finger - KIRF link	Count in multiples using fingers as each multiple is said. Pupils can count fingers to say amount for a given multiple eg: What is 8 times 2?  $8 \times 2 = 16$



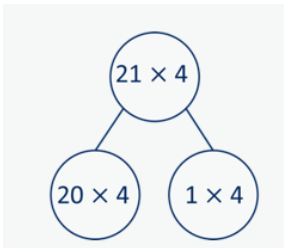
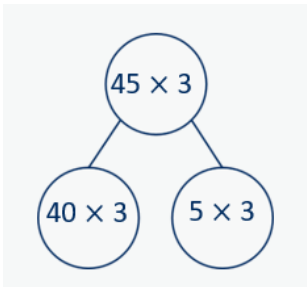
Year 3: Multiplication

Year 3	•Use fingers to count in multiples of 3, 4 and 8 and use fingers to derive multiple e.g. what is 4 times 8 and count to 4th finger - KIRF link •Related facts - know if $3 \times 7 = 21$ then 7×3 must also be 21 •Multiply a 2-digit number by a 1-digit number - no exchange $21 \times 4 = 20 \times 4$ and $1 \times 4 = 80 + 4 = 84$ •Multiply a 2-digit number by a 1-digit number - with exchange $45 \times 3 = 40 \times 3$ and $5 \times 3 = 120 + 15 = 135$
Key Methods	Examples and guidance
•Use fingers to count in multiples of 3, 4 and 8 and use fingers to derive multiple e.g. what is 4 times 8 and count to 4th finger - KIRF link	Count in multiples using fingers as each multiple is said. Pupils can count fingers to say amount for a given multiple e.g.: What is 7 times 8? $7 \times 8 = 56$ $8 \times 7 = 56$  
•Related facts - know if $3 \times 7 = 21$ then 7×3 must also be 21 and	 $3 \times 5 = 15$ $5 \times 3 = 15$ If $2 \times 10 = 20$ Then $10 \times 2 = 20$ If $3 \times 7 = 21$ Then $7 \times 3 = 21$ If $3 \times 4 = 12$ Then $3 \times 40 = 120$ If $5 \times 8 = 40$ Then $50 \times 8 = 400$



Year 3: Multiplication Continued



Key Methods	Examples and guidance	
•Multiply a 2-digit number by a 1-digit number - no exchange $21 \times 4 = 20 \times 4$ and $1 \times 4 = 80 + 4 = 84$		$\begin{array}{l} 23 \times 3 = \\ 20 \times 3 = 60 \\ 3 \times 3 = 9 \\ 60 + 9 = 69 \\ 23 \times 3 = 69 \end{array}$
•Multiply a 2-digit number by a 1-digit number - with exchange $45 \times 3 = 40 \times 3$ and $5 \times 3 = 120 + 15 = 135$		$\begin{array}{l} 24 \times 4 = \\ 20 \times 4 = 80 \\ 4 \times 4 = 16 \\ 80 + 16 = 96 \\ 24 \times 4 = 96 \end{array}$



Year 4: Multiplication

Year 4

• Multiply a 2 or 3-digit number by a 1-digit number - short method which can be in the expanded form

Key Methods

Examples and guidance

• Multiply a 2 or 3-digit number by a 1-digit number - short method which can be in the expanded form

		H	T	O	
			3	4	
	x			5	
			2	0	
		1	5	0	
		1	7	0	

Expanded form

(4 × 5)
(30 × 5)

		3	8		
x			7		
	5	6	(7 × 8)		
2	1	0	(7 × 30)		
2	6	6			

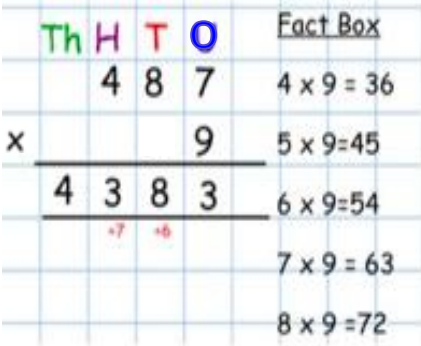
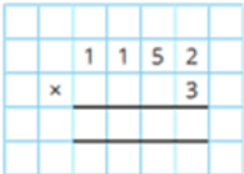
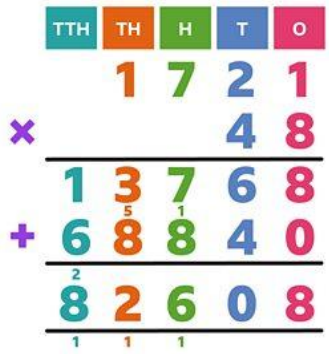
Non-expanded form

		H	T	O	
			3	4	
	x			5	
		1	7	0	
		1	2		

		3	8
x			7
2	6	6	
	5		



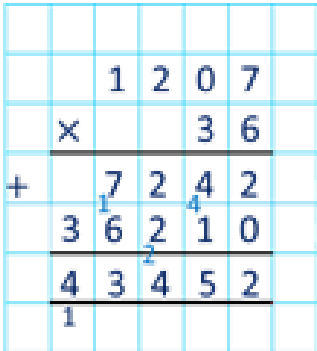
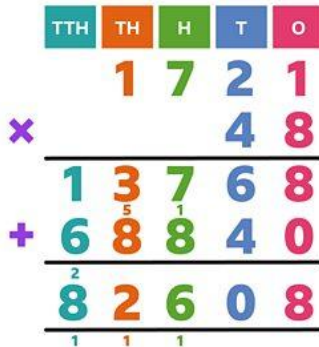
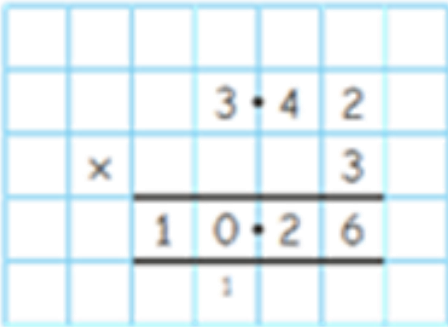
Year 5: Multiplication

Year 5	• Multiply numbers up to 4 digits by a 1-digit number - short written method • Multiply numbers up to 4 digits by a 2-digit number - short written method	
Key Methods	Examples and guidance	
• Multiply numbers up to 4 digits by a 1-digit number - short written method		Multiplication facts can be jotted if needed to assist. Fingers may also be used to assist. 
• Multiply numbers up to 4 digits by a 2-digit number - short written method		



Year 6: Multiplication



Year 6	• Multiply numbers up to 4 digits by a 2-digit number - written method • Multiply decimals by integers - written method	
Key Methods	Examples and guidance	
• Multiply numbers up to 4 digits by a 2-digit number - written method	 $\begin{array}{r} 1207 \\ \times 36 \\ \hline 7242 \\ 36210 \\ \hline 43452 \end{array}$ (1,207 × 6) (1,207 × 30)	 $\begin{array}{r} \text{TTH} \quad \text{TH} \quad \text{H} \quad \text{T} \quad \text{O} \\ 1721 \\ \times 48 \\ \hline 13768 \\ + 68840 \\ \hline 82608 \end{array}$
• Multiply decimals by integers - written method	 $\begin{array}{r} 3.42 \\ \times 3 \\ \hline 10.26 \end{array}$	3.77 × 2.8 3.77 (2 decimal places) 2.80 (2 decimal places) Remove the decimals and multiply, then add the decimal point after counting the decimal places in the question. $\begin{array}{r} 377 \\ \times 280 \\ \hline 30160 \\ 75400 \\ \hline 105560 \end{array}$



Newbald Primary School Maths Key Calculation Methods



Division



Nursery: Division



Nursery

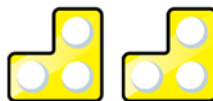
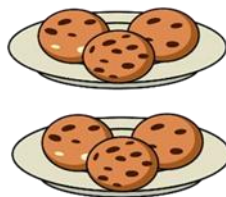
- Continue with counting and subitising skills as a foundation for later work on equal groups. (see addition and subtraction sections)

- Continue with counting and subitising skills as a foundation for later work on equal groups. (see addition and subtraction sections)
- Can physically make equal groups of counters, beads from a given amount etc
- Can physically share counters, beads etc into groups

Progression of skills

- Can physically make equal groups of counters, beads from a given amount etc
- Can physically share counters, beads etc into groups

Key representations





Reception: Division

•Reception

- Have a deep understanding of number to 10, including the composition of each number.
- Subitise (recognise quantities without counting) up to 5
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double facts.
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

•Sharing

•Grouping

- Can physically make equal groups of counters, beads from a given amount etc
- Can physically share counters, beads etc into groups

Progression of skills

Key representations

Sharing

Provide practical activities such as sharing items during snack time. Encourage children to check whether items have been shared fairly (equally).

There are ... altogether.

They are shared equally between ... groups.



Grouping

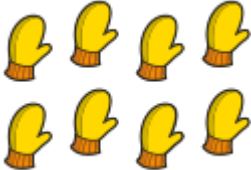
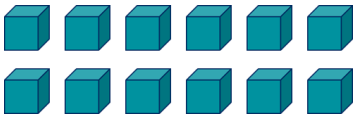
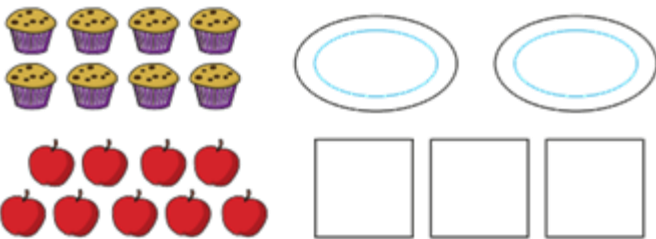
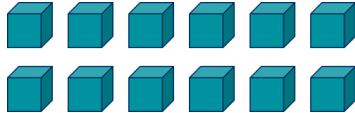
Provide opportunities to make equal groups when tidying up or during snack time. Encourage children to check that each group has the same amount.

There are ... groups of ...
There are ... altogether.



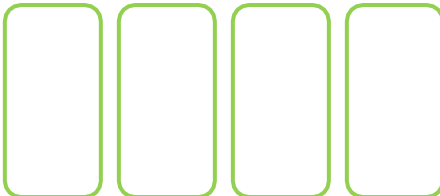


Year 1: Division

Year 1	•Make equal groups - grouping - Using pictures or using physical items to derive fact •Make equal groups - sharing - Using physical items to derive fact •Find a half - by splitting items into 2 groups (physically) •Find a quarter - by splitting items into 4 (physically) - or half and half again		
Key Methods	Examples and guidance		
•Make equal groups - grouping - Using pictures or using physical items to derive fact	Circle groups of 2 There are ... groups of 2 	Take ... cubes. Make equal groups.  There are ... groups of ...	There are ... altogether. How many groups of ... can you make? 
•Make equal groups - sharing - Using physical items to derive fact	have been shared equally between... There are ... on/in each ... 		Take ... cubes. Share them between ...  12 shared between ... is ...



Year 1: Division Continued

Key Methods	Examples and guidance		
•Find a half - by splitting items into 2 groups (physically)	To find half, I need to share into 2 equal groups.   There are ... in each group. So is half of	Half of ... is ...   	
	•Find a quarter - by splitting items into 4 (physically) - or half and half again	To find a quarter, I need to share into 4 equal groups.   There are ... in each group. So is one quarter of	A quarter of ... is ...   

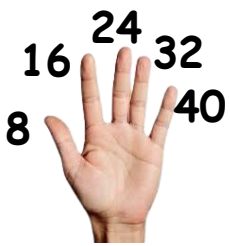
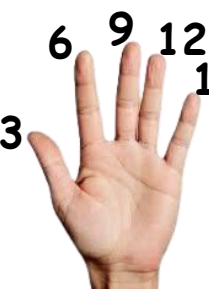


Year 2: Division

Year 2	•Use fingers to count in multiples of 2, 5 and 10 and use fingers to derive fact e.g. what is 16 divided by 2 and count to 16 in 2s using fingers and count how many fingers = 8 KIRF link •Use arrays - drawn by hand to derive fact - grouping and sharing by drawing
Key Methods	Examples and guidance
•Use fingers to count in multiples of 2, 5 and 10 and use fingers to derive fact e.g. what is 16 divided by 2 and count to 16 in 2s using fingers and count how many fingers = 8 KIRF link	$16 \div 2 =$ Count in multiples using fingers as each multiple is said. Pupil stops at target number (16) Pupils can count fingers to complete calculation $16 \div 2 = 8$
•Use arrays - drawn by hand to derive fact - grouping and sharing by drawing	



Year 3: Division

Year 3	•Divide a 2-digit number by a 1-digit number - no exchange - Use fingers to count in multiples of 3, 4 and 8 and use fingers to derive fact e.g. what is 32 divided by 4 and count to 32 in 4s using fingers and count how many fingers = 8 KIRF link
Key Methods	Examples and guidance
•Divide a 2-digit number by a 1-digit number - no exchange - Use fingers to count in multiples of 3, 4 and 8 and use fingers to derive fact e.g. what is 32 divided by 4 and count to 32 in 4s using fingers and count how many fingers = 8 KIRF link	$56 \div 8 =$ Count in multiples (of 8) using fingers as each multiple is said. Pupil stops at target number (56) Pupils can count fingers to complete calculation   $56 \div 8 = 7$ $36 \div 3 =$ Count in multiples (of 3) using fingers as each multiple is said. Pupil stops at target number (36) Pupils can count fingers to complete calculation - pupils will need to 'restart fingers' for multiples past 10    $36 \div 3 = 12$

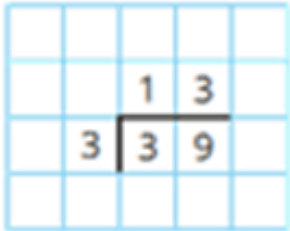
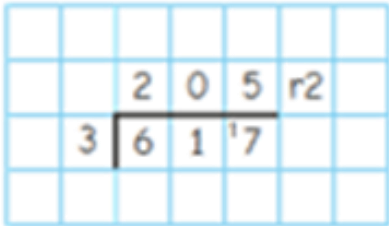
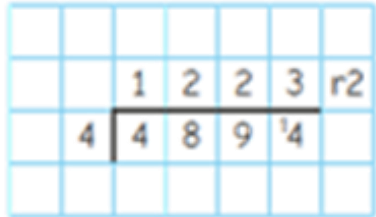


Year 4: Division

Year 4	• Divide a 2-digit number by a 1-digit number - with remainders Use fingers to count in multiples of 3, 4 and 8 and use fingers to derive fact e.g. what is 34 divided by 4 and count to nearest multiple below = 32 in 4s using fingers and count how many fingers = 8 then count how many left over 2 so 8r2 - use jottings to assist (can include number line use)
Key Methods	Examples and guidance
• Divide a 2-digit number by a 1-digit number - with remainders Use fingers to count in multiples of 3, 4 and 8 and use fingers to derive fact e.g. what is 34 divided by 4 and count to nearest multiple below = 32 in 4s using fingers and count how many fingers = 8 then count how many left over 2 so 8r2 - use jottings to assist (can include number line use)	$58 \div 8 =$ Count in multiples (of 8) using fingers as each multiple is said. Pupil stops at multiple below target number (56) Pupils can count fingers and then count on from multiple to target number to identify remainder. Multiples can also be written out to calculate division calculation with remainders as in pictured example. $58 \div 8 = 7r2$ To count remainder

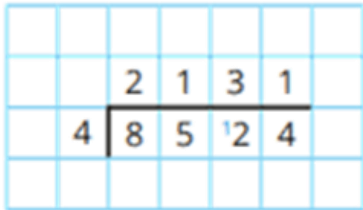
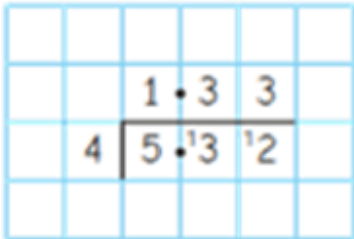
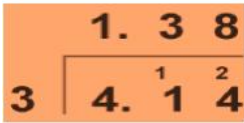
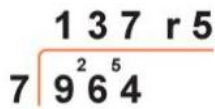
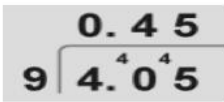
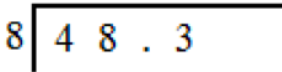
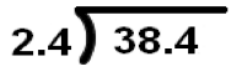


Year 5: Division

Year 5	•Divide numbers up to 4 digits by a 1-digit number - short written method		
Key Methods	Examples and guidance		
•Divide numbers up to 4 digits by a 1-digit number - short written method			



Year 6: Division

Year 6	•Short division - short written method including remainders & expressing as decimals •Divide decimals by integers - Short written method - give answer as decimal •Divide by a non-prime 2 digit number using factor pairs	
Key Methods	Examples and guidance	
•Short division - short written method including remainders & expressing as decimals	 $4 \overline{) 34} \begin{matrix} 8 \\ r\ 2 \end{matrix}$	Encourage children to interpret remainders in context, for example knowing that "4 remainder 1" could mean 4 complete boxes with 1 left over so 5 boxes will be needed.
•Divide decimals by integers - Short written method - give answer as decimal		 $3 \overline{) 1.38}$  $7 \overline{) 137} \begin{matrix} 19 \\ r\ 5 \end{matrix}$  $9 \overline{) 0.45}$  $8 \overline{) 0.1375}$  $8 \overline{) 48.3}$  $2.4 \overline{) 38.4}$



Year 6: Division

Key Methods

- Divide by a non-prime 2 digit number using factor pairs

Examples and guidance

$$546 \div 21 = \boxed{26}$$

$$\begin{array}{r} 3 \times 7 \\ 3 \overline{) 546} \end{array}$$

$$\begin{array}{r} 182 \\ 3 \overline{) 546} \end{array}$$

$$\begin{array}{r} 26 \\ 7 \overline{) 1842} \end{array}$$

$$900 \div 36 = \boxed{25}$$

$$\begin{array}{r} 6 \times 6 \\ 6 \overline{) 900} \end{array}$$

$$\begin{array}{r} 150 \\ 6 \overline{) 900} \end{array}$$

$$\begin{array}{r} 25 \\ 6 \overline{) 150} \end{array}$$

$$3384 \div 72 = \boxed{}$$

$$\begin{array}{r} 8 \times 9 \\ 8 \overline{) 3384} \end{array}$$

$$\begin{array}{r} 423 \\ 8 \overline{) 3384} \end{array}$$

$$\begin{array}{r} 423 \\ 9 \overline{) 423} \end{array}$$

