Year 2

Calculation policy

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Guidance for teachers



The calculation policy is divided into four sections: addition, subtraction, multiplication and division. At the start of each section, you will find an overview of the progression of skills. Calculations involving decimal numbers and fractions are included.

The calculation policy follows the same concrete, pictorial, abstract approach as our main schemes of learning. Where appropriate, sentence stems and key questions are included alongside the key representations.

Where skills are divided into more than one section across the page, there is a progression in the level of difficulty from left to right.

For example, when adding across a 10, children need to be able to add across 10 itself, before making links with related facts.



Progression of skills – Addition



Year 1	Year 2	Year 3
Add together	 Add 1s to any number (related facts) 	 Add 1s, 10s and 100s to a 3- digit number
Add moreBonds within 10	 Add three 1-digit numbers 	• Add two numbers (no
 Related facts within 20 	Add across a 10	exchange)Add two numbers across a 10
Missing numbers	Add multiples of 10Add 10s to any number	or 100
	 Add two 2-digit numbers (not 	 Complements to 100 Add fractions with the same
	across a ten)	denominator within 1 whole
	 Add two 2-digit numbers (across a ten) 	 Calculate the duration of events
	Missing numbers	

Addition



Year 2	 Recall and use addition facts to 20 fluently, and derive and use related facts up to 100 Add numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and 1s a two-digit number and 10s 2 two-digit numbers adding 3 one-digit numbers Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. 		
Progression of skills	Key representations		
Add ones to any number (related facts) Make links to known facts.	I know that and = so and =	more than is so more than is $0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ 9 \ 10$ $+1 \ +1 \ +1 \ +1 \ +1 \ +1 \ +1 \ +1 \$	What do you notice? Can you continue the pattern? 5+2=7 15+2=17 25+2=27
Add three 1-digit numbers Prompt children to understand that addition can be done in any order and to make links to known facts.	$ \begin{array}{c} \dots \text{ and } \dots \text{ are a bond to 10} \\ 10 + \dots = \dots \\ \hline \\$	Double + = $ \begin{array}{c} ? \\ 4 & 3 & 3 \\ \hline 3 & 4 & 3 \end{array} $	What do you notice? Which addition is the easiest to calculate? 8+9+1= 8+1+9= 9+1+8=

Addition

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Progression of skills	Key representations				
Add across a 10	can be partitioned into and		I add to get to th	en I add	8 + 5 = 13 28 + 5 = 33
Partition the number being added to make a full ten.					
	8 + 5 + + + + + + + + + + + + + + + + +	+3	28 + 5	3 4 5 6	+2 +3 7 8 9 10 11 12 13 +2 +3
	$\left(\begin{array}{c}2\\3\end{array}\right)$		$\left(\begin{array}{c}2\\3\end{array}\right)$	23 24 25 26 2	27 28 29 30 31 32 33
Add multiples of 10	ones + ones = ones so tens + tens = tens		is the same? is different?	2	20
Make links to known facts within ten.	3 + 2 = 5 30 + 20 = 50		+2 2 3 4 5 6 7 8 9 +2 20 30 40 50 60 70 80 90	2	7 3 7 30
Add 10s to any number	tens + tens = tens tens and ones =	To ad tim	d I need to add 10 nes.	I know that so and :	and = =
Make links to known facts.		1 2 11 1 21 2 31 3	2 3 4 5 6 7 8 9 10 12 13 14 15 16 17 18 19 20 12 23 24 25 26 27 28 29 30 12 33 34 35 36 37 38 39 40 12 43 44 45 46 47 48 49 50	30 -	+ 20 = 50 + 20 = 54

Addition



Progression of skills	Key representations		
Add 2-digit numbers (not across a ten) Lining up ones and tens in columns will support with later written methods.	ones + ones = ones tens + tens = tens	Tens Ones Image: State of the state of	3 ones + 1 one = 4 ones $4 tens + 2 tens = 6 tens$ $6 tens + 4 ones = 64$ 21 $?$ 43 21
Add 2-digit numbers (across a ten) Begin to exchange 10 ones for 1 ten.	$\dots \text{ ones} = \dots \text{ ten and } \dots \text{ ones}$	12 ones = 4 tens + 3	45 37 $7 0nes = 12 0nes$ $1 ten and 2 ones$ $1 ten s tens + 1 ten = 8 tens$ $2 0nes = 82$
Missing numbers Solve missing number problems and use the inverse to check.	How many more do you need to make? $6 + \boxed{} = 10$ $10 - \boxed{} = 6$	If is a whole and is a part, then is the other part. 7 1 + 3 = 7 7 - 3 = 3	can be partitioned into and 10 + 8 = 12 +

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Progression of skills - Subtraction



Year 1	Year 2	Year 3
Find a partTake away	 Subtract 1s from any number (related facts) 	 Subtract 1s, 10s and 100s from a 3-digit number
Bonds within 10	Subtract across a 10Subtract multiples of 10	 Subtract two numbers (no exchange)
Related facts within 20Missing numbers	 Subtract 10s from any number 	 Subtract two numbers across a 10 or 100
	 Subtract two 2-digit numbers (not across a ten) 	Complements to 100
	 Subtract two 2-digit numbers (across a ten) 	 Subtract fractions with the same denominator within 1 whole
	Missing numbers	

Subtraction



	 Recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100 Subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and 1s a two-digit number and 10s 2 two-digit numbers Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. 			
Progression of skills	Key representations			
Subtract ones from any number (related facts) Make links to known facts.	I know that minus = so minus =	$\begin{array}{c} \dots \text{ less that} \\ \text{so } \dots \text{ less } \\ \hline \\ 0 & 1 & 2 & 3 \\ \hline \\ 20 & 21 & 22 & 23 \end{array}$	than is 4 5 6 7 8 9 10	What do you notice? Can you continue the pattern? 8-3 = 5 18-3 = 15 28-3 = 25
Subtract across a 10	can be partitioned into ar	can be partitioned into and Make links with related facts.		ated facts.
Partition the number being subtracted to bridge through a ten.	13 - 5 $3 2$	2 - 3 10 11 12 13	33 - 5 $33 - 2$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

Subtraction

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Progression of skills	Key representations	
Subtract multiples of 10 Make links to known facts within ten.	ones $$ ones $=$ ones so tens $$ tens $=$ tens 5 - 2 = 3 50 - 20 = 30	What is the same? What is different? 5 2 5 2 2 2 20 20 20 20 20
Subtract 10s from any number Make links to known facts.	tens $-$ tens $=$ tens tens and ones $=$	To subtract I need to subtract 10 times. I know that minus = so minus = so minus = $1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ 9 \ 10 \ 11 \ 12 \ 13 \ 14 \ 15 \ 16 \ 17 \ 18 \ 19 \ 20 \ 21 \ 22 \ 23 \ 24 \ 25 \ 26 \ 27 \ 28 \ 29 \ 30 $ $50 - 20 = 30 \ 21 \ 20 \ 20$
		31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

Subtraction



Progression of skills	Key representations		
Subtract two 2-digit numbers (not across a ten)	$ \begin{array}{c} \dots \text{ ones } - \dots \text{ ones } = \dots \text{ ones} \\ \dots \text{ tens } - \dots \text{ tens } = \dots \text{ tens} \\ \hline 43 \\ \hline 21 \\ \hline \end{array} $	Image: state of the state	= 2 tens
Subtract two 2-digit numbers (across a ten) Begin to exchange 1 ten for 10 ones.	43 25 43 43 3 ones -	because I do not have enough or T T T T T T T T T T	
Missing numbers Solve missing number problems and use the inverse to check.	How many do you need to subtract to make? $10 - \boxed{=} = 6$ $6 + \boxed{=} = 10$	If is a whole and is a part, then is the other part. 7 - 3 = 2 3 + 3 = 7	can be partitioned into and $18 - \boxed{} = 12 + 2$

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Progression of skills – Multiplication



Year 1	Year 2	Year 3
 Count in 2s, 5s and 10s Add equal groups Make arrays Make doubles 	 Link repeated addition and multiplication Use arrays Double The 2 times-table 	 The 3 times-table The 4 times-table The 8 times-table Related facts Multiply a 2-digit number by a
	 The 10 times-table The 5 times-table Missing numbers 	 Multiply a 2-digit number by a 1-digit number - no exchange Multiply a 2-digit number by a 1-digit number - with exchange Scaling Correspondence problems

Multiplication

Year 2	 Recall and use multiplication facts for the 2, 5 and 10 multiplication tables. Calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (×) and equals (=) signs. Show that multiplication of two numbers can be done in any order (commutative). 		
Progression of skills	Key representations		
Link repeated addition and multiplication Encourage children to make the link between repeated addition and multiplication.	There are equal groups with in each group. There are altogether.	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	
Use arrays	There are rows with in each row. There are columns with in each column.	I can see \times and \times	
Encourage children to see that multiplication is commutative.	3 lots of 5 = 15 5 + 5 + 5 = 15 5 lots of 3 = 15 3 + 3 + 3 + 3 = 15	$3 \times 5 = 15$ $5 \times 3 = 15$ $3 \times 5 = 5 \times 3$	
Double	Double is Double	is so double is	
Encourage children to make links with related facts.	$ \begin{array}{c} \blacksquare \\ \blacksquare $	 Double 4 is 8 Double 40 is 80 	

Multiplication



Progression of skills	Key representations
The 2 times-table Encourage daily counting in multiples both forwards and back. Notice that all multiples of 2 are even numbers.	$ \begin{array}{c} \text{ lots of } 2 = \\ \times 2 = \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$
	? ?
The 10 times-table Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.	$ \begin{array}{c} \text{ lots of } 10 = \\ \times 10 = \\ \end{array} \\ \begin{array}{c} \times 10 = \\ \end{array} \\ \begin{array}{c} \times 10 = \\ \end{array} \\ \begin{array}{c} \text{times } 10 \text{ is equal to } \\ \hline 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\ \hline 11 & 12 & 13 & 14 & 15 & 16 & 17 & 18 & 19 & 20 \\ \hline 21 & 22 & 23 & 24 & 25 & 26 & 27 & 28 & 29 & 30 \\ \hline 31 & 32 & 33 & 44 & 35 & 36 & 37 & 38 & 39 & 40 \\ \end{array} \\ \begin{array}{c} \text{I} \times 10 = 10 & 10 = 1 \times 10 \\ 2 \times 10 = 20 & 20 = 2 \times 10 \\ 3 \times 10 = 30 & 30 = 3 \times 10 \\ \end{array} \\ \begin{array}{c} \text{I} \times 10 = 30 & 30 = 3 \times 10 \\ \end{array} \\ \end{array} $

Multiplication



Progression of skills	Key representations	
The 5 times-table Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.	$ \begin{array}{c} \dots \text{ lots of 5} = \\ \dots \times 5 = \\ & \swarrow & \swarrow & \swarrow & \swarrow & \swarrow & & \swarrow \\ & & & & &$	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 1 × 5 = 5 5 = 1 × 5 2 × 5 = 1 × 5 2 × 5 = 10 10 = 2 × 5 3 × 5 = 15 15 = 3 × 5
	5 5 5 5 5	0 5 10 15 20 25 30 35 40 45 50 55 60
Missing numbers	is equal to groups of	times is equal to
Make links to known facts.	18 socks, how many pairs?	$\square \times 2 = 18$
	0 2 4 6 8 10 12 14 16 18 20	18 = 2 ×

Progression of skills – Division



Year 1	Year 2	Year 3
Make equal groups – grouping	Divide by 2	• Divide by 3
Make equal groups – sharing	Divide by 10	• Divide by 4
Find a half	Divide by 5	• Divide by 8
Find a quarter	Missing numbers	Related facts
	Unit fractions	• Divide a 2-digit number by a
	Non-unit fractions	1-digit number - no exchange
		 Divide a 2-digit number by a 1-digit number - with remainders
		 Unit fractions of a set of objects
		 Non-unit fractions of a set of objects

Division



Year 2	 Recall and use division facts for the 2, 5 and 10 multiplication tables. Calculate mathematical statements for division within the multiplication tables and write them using the division (÷) and equals (=) signs. Recognise, find, name and write fractions ¹/₃, ¹/₄, ²/₄ and ³/₄ of a quantity. 		
Progression of skills	Key representations		
Divide by 2 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts and halving.	There are equal groups of 2 $\div 2 =$ $4 \times 2 = 8$ $8 \div 2 = 4$ 0 1 2 3 4 5 6 7 8 9 10	shared equally between 2 is Half of is $ \div 2 =$ $4 \times 2 = 8$ $8 \div 2 = 4$	
Divide by 10 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are equal groups of 10 $\div 10 =$ $6 \times 10 = 60$ $60 \div 10 = 6$	shared equally between 10 is $ \div 10 =$ $6 \times 10 = 60$ $60 \div 10 = 6$ 60 6 6 6 6 6 6 6 6	

Division



Progression of skills	Key representations	
Divide by 5 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are equal groups of 5 $\div 5 =$ $6 \times 5 = 30$ $30 \div 5 = 6$ 5 = -5 5 = -5	shared equally between 5 is $\therefore \div 5 = \dots$ $6 \times 5 = 30$ $30 \div 5 = 6$ 30
Missing numbers Bar models are useful to show the link between multiplication and division.	divided by 2/5/10 is equal to ? 10 10 ? 10 10 ? 10 10 ? 10 10 ? 10 10 10 10 10 10 ? 10 10 10 10 10 10 10 10 10 10	$ \begin{array}{c} 0 \\ 0 \\ 10 \end{array} \dot{} = 10 \end{array} $

Division



Progression of skills	Key representations	
Unit fractions In Y2 the focus is on finding $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{3}$ Bar models are useful to show the link between division and finding a fraction.	The objects have been shared fairly into groups. $\frac{1}{\Box}$ of is	There are equal parts. There is part circled. $\frac{1}{\Box}$ is circled.
Non-unit fractions In Y2 the focus is on finding $\frac{2}{4}$ and $\frac{3}{4}$ Prompt children to notice that $\frac{2}{4}$ is equivalent to $\frac{1}{2}$	The objects have been shared fairly into groups. of is	There are equal parts. There are parts circled. is circled.