

Town Centre Collaboration Primary Calculations Policy (Shawlands) EYFS to Year 6

Updated 2016

Shawlands Calculation Policy

Addition and Subtraction ->/---Key skills Development Matters Band: 16-26 Months Key skills 🖹 Addition Objectives/Key skills – see early years profile Addition Objectives/Key skills - see early years profile **Objectives: Objectives:** Knows that things exist, even when out of sight. Equip the role-play area with things that can be sorted ٠ in different ways. Beginning to organise and categorise objects, e.g. Provide collections of objects that can be sorted and putting all ٠ matched in various ways. The teddy bears together or teddies and cars in Kev skills ٠ separate piles. Recognise numbers 1-10. Provide resources that support children in making one to Spot numbers in the environment. one correspondences, e.g. giving each dolly a cup. Says some counting words randomly. Count up to 10 objects reliably. Conservation. . See EYFS for key skills and counting in addition and Use number words in meaningful contexts, e.g. 'Here • Find one more than a number. subtraction is your other mitten. Now we have two'. Recording numbers using pictures or apparatus Talk to young children about 'lots' and 'few' as they (e.g. Numicon.) play. Talk about young children's choices and, where appropriate, demonstrate how counting helps us to find out how many. Talk about the maths in everyday situations, e.g. d ٠ ning up a coat, one hole for each hutton Vocabulary: Vocabulary: Vocabulary: Vocabulary: Double, lots of, grou Share, halve, groups of Vocabulary: More than, enough, count Vocabulary: Less than, fewer, least, on, lots of, bigger, most, addition, add enough, count back, smaller, take away, equal on, plus, forwards, before, total, higher, difference, before, down, backwards,

Core Concepts

lower

up

Number and Place Value Subtraction	Multiplication and Division	Fractions, Decimals, Percentages
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With each of the core concepts, children will be using and applying their maths learning by solving problems and look at reasoning, such as 'trial and improvement', daily,

Addition		
Year 1 Stop 16-18	Year 2 Stop 19-21	Year 3 Stop 22.24
Step 10-10		Step 22-24
Key skills	Key skills	Key skills
Read and write numbers to 100 in numerals (1-20 in words) Count to and across 100 Recall bonds to 10 and 20, and addition facts within 20 ('story of' 5, 6, 7, 8, 9 and 10)	Locate any 2-digit number on a landmarked line and use this to compare numbers; record comparisons < and >, e.g. 56 > 39. Identify any number on the 1-100 number grid; understand that each number is a multiple of ten and some ones, e.g. 54 is 50 and 4 more. Add two single digit numbers (8 + 7) by counting up; add	Know pairs with each total to 20 Know pairs of multiples of 10 with a total of 100 Add any two 2-digit numbers by counting on in 10s and 1s or by using partitioning
Count on in ones from a given 2-digit number	two 2-digit numbers which total less than 100 by counting on in tens and ones, e.g. 54 + 37 as 54 + 30 + 7.	Add multiples and near multiples of 10 and 100 Add 1,10, 100 to 3-digit numbers
Add three single-digit numbers spotting doubles or pairs to 10 Count on in tens from any given 2-digit number Add 10 to any given 2-digit number Use number facts to add single-digit numbers to two-digit numbers, e.g. use 4 + 3 to work out 24 + 3, 34 + 3	Know securely number pairs for all the numbers up to and including 12 Count in steps of 2, 5, and 10 from 0. Know different unit patterns when not crossing a ten, e.g. 4 + 3 = 7, 14 + 3 = 17, 24 + 3 = 27 Begin to recognise unit patterns when crossing a ten, e.g. 5 + 6 = 11 Know pairs with a total of 20 and multiples of 10 to 100	Understand place value in 3-digit numbers Perform place value additions without a struggle. (E.g. 300 + 8 + 50 = 358) Use place value and number facts to add a 1-digit or 2-digit number to a 3-digit number. (E.g. 104 + 56 is 160 since 104+50=154 and 6+4=10 and 676 + 8 is 684, since 8 =4+4 and 76+4+4=84)
Add by putting the larger number first Recognise doubles to double 6 KQ/language: add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line	 Count on in ones and tens from any given 2-digit number Add two or three single-digit numbers Add a single-digit number to any 2-digit number using number facts, including bridging multiples of 10. Add 10 and small multiples of 10 to any given 2-digit number. Add any pair of 2-digit numbers Know that adding can be done in any order Solve problems with addition using concrete objects, pictorial representations, involving numbers, quantities and measures, applying written and mental method KQ/language: See year 1, as well as <i>sum, tens, units, partition, addition, achurat tens hourden</i> 	Add pairs of 'friendly' 3-digit numbers mentally, e.g. 320 + 450 Begin to add amounts of money using partitioning. Solve problems with addition using number facts, place value, missing numbers. KQ/language: See year 1 and 2, as well as <i>hundreds boundary, increase,</i> <i>vertical, 'carry', expanded, compact</i>
	column, tono boundary	

Year 1 Step 16-18	Addition Year 2 Step 19-21	Year 3 Step 22-24
+ = signs and missing numbers Children need to understand the concept of equality before using the '=' sign. Calculations should be written either side of the equality sign so that the sign is not just interpreted as 'the answer'. Partitioning and re-partitioning support the understanding of place-value. $30+6$ $20+16$ All of these representations still comprise the amount of 36. $2 = 1+1$ $2 + 3 = 4 + 1$	$\frac{+ = \text{signs and missing numbers}}{\text{Continue using a range of equations as in Year 1 but with appropriate, larger numbers. Continue with 1 step word problems and moving onto 2-step.}$ Extend to $14 + 5 = 10 + \Box \text{ (balanced equations)}$ and $32 + \Box + \Box = 100 35 = 1 + \Box + 5$ Partition into tens and ones and recombine $12 + 23 =$ $10 + 20 =$ $2 + 3 =$	<u>+ = signs and missing numbers</u> Continue with calculation methods from year 2 and then moving onto showing the expanded method. Continue to show different representations – CPA. Only use place value counters when children are extremely confident with dienes and place value. Image: State Sta
3 = 3 $2 + 2 + 2 = 4 + 2$ Use base 10/denes/numicon to support as appropriate Missing numbers need to be placed in all possible places. $3 + 4 = 0$ $3 + 4 = 7$ $7 = 0 + 4$ $4 + 4 = 7$ $7 = 3 + 0$ $4 = 7$ $7 = 3 + 0$	Recap mentally how to partition into tens and ones • Partition both numbers and recombine. Count on by partitioning the second number only + 30 + 6 52 50	Showing different models (see above), particularly dienes: Introduce transition from concrete place value representations, (e.g. or straws), to pictorial – such as place value counters or money.
Also include recognition of missing signs $3 \Box 7 = 10$	Using blank number lines or a hundred square as appropriate <u>Partitioning and bridging through 10.</u> The steps in addition often bridge through a multiple of 10	Continue using partitioning to move onto the expanded column addition method. e.g. partitioning 53 + 36 =
Activities Children should have access to a wide range of counting equipment, everyday objects, as well as hoops, sorting trays, number tracks and numbered number lines. Begin introducing 1 step word problems. Teacher modelling Drawing jumps on numbered number lines to support	e.g. $_{+2}$ $^{+5}$ Children should be able to partition the 7 to relate adding the 2 and then the 5. 8 + 7 = 15 $\underbrace{8 10 \qquad 15}$	50 + 3 = $30 + 6 =$ Presented as the expanded column method $50 + 3$ $30 + 6$ $80 + 9$ For the purpose of Y2 SATS – Move onto compact method and introduce column method without bridging through 10.
Children To create their own jumps using rulers, fingers, pens, bodies etc. 7+ 4	Add 9 or 11 by adding 10 and adjusting by 1 e.g. Add 9 by adding 10 and adjusting by 1 35 + 9 = 44 44 45	Pencil and paper procedures Model the partitioning of numbers to introduce to column method 37 +12 <u>9 (</u> 7+2) <u>40 (</u> 30 +10) <u>49</u>

Introduce making a breaking

Use of number lines and grids to add and subtract

Introduce to column addition with 2 and 3 digits where

Year 4 Step 25-27	Addition Year 5 Step 28-30	Year 6 Step 31-33
Key skills	Key skills	Key skills
Select appropriate method, mental, jottings, written and explain why Add any two 2-digit numbers by partitioning or counting on Know by heart/quickly derive number bonds to 100 (eg 32 + 68) and to £1 (64p + 36p) Add to the next hundred, pound and whole number. (E.g. 234 + 66 = 300, 3.4 + 0.6 = 4) Perform place value additions without a struggle. (E.g. 300 + 8 + 50 + 4000 = 4358) Add multiples and near multiples of 10, 100 and 1000. Add £1, 10p, 1p to amounts of money Use place value and number facts to add 1-, 2-, 3-and 4- digit numbers where a mental calculation is appropriate'. (E.g. 4004 + 156 by knowing that 6+4=10 and that 4004+150= 4154 so total is 4160) Perform inverse operations to check Solve 2-step problems in context Continue to practise a wide range of mental addition strategies eg. Round and adjust, near doubles, numbers bonds, partitioning and recombining KQ/language: See years 1, 2, 3 also, as well as <i>thousands, hundreds,</i> <i>digits, inverse</i>	 Locate 5 and 6 digit numbers on a landmarked line; use this to compare/order numbers. Round to ten, a hundred, a thousand or ten thousand. Use rounding to check accuracy. Understand a one-place decimal number as a number of tenths and a two-place decimal number as a number of hundredths. Add or subtract 0.1 or 0.01 to/from any decimal number with confidence, e.g. 5.83 + 0.01 or 4.83 - 0.1 Add and subtract mentally with confidence - where the numbers are less than 100 or the calculation relies upon simple addition and place value. Confidently add numbers with more than 4-digits using a secure written method, including adding 'piles' of numbers Use inverse to check calculations KQ/language: See years 1, 2, 3, 4 also, as well as decimal places, decimal point, tenths, hundredths, thousandths. 	Add mentally with confidence using larger numbers and calculations of increasing complexity Add several large numbers using written addition Add several large or decimal numbers using written addition Perform mental calculations, including with mixed operations and large numbers, using a range of strategies Solve multi-step problems Use estimation and inverse to check the validity of an answer KQ/language: All from years 1, 2, 3, 4, 5, (add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, addition, column, tens boundary, hundreds boundary, increase, vertical, 'carry', expanded, compact, thousands, hundreds, digits, inverse, decimal places, decimal point, tenths, hundredths, thousandths).

Subtraction		
Year 1 Step 16-18	Year 2 Step 19-21	Year 3 Step 22-24
Key skills	Key skills	Key skills
Give a number, say one less	Pacagnize that addition and subtraction are inverse	Understand place value in 2 digit numbers: add and
Count back in ones to from 100 and from any single-digit or 2-digit number.	operations and understand that $10 - 4 = 6$ as well as $6 + 4 = 10$.	subtract 1s, 10s or 100s without difficulty; use this to add and subtract multiples of 1, 10, 100 to/from 3-digit numbers.
Count back in tens from any 2-digit number	count back in ones or tens to take away, e.g. $27 - 3 = or$ 54 - 20 =.	Mentally subtract any pair of 2 digit numbers, e.g. 75 – 58
Locate any number on a 1-100 grid or a beaded line 0-100.	Begin to count up to find a difference between two	Recognise that there are two ways of completing
Know number bonds to 10, also know what is left if objects are taken from 10, e.g. 10 fingers, fold down 4, leaves 6 standing.	numbers with a small gap $(42 - 38)$. Know when to count on and when to count back	subtractions, either by counting up or by counting back, e.g. $54 - 3$ (counting up)
Solve one-step problems involving subtraction, using concrete objects (bead strings, objects, cubes) and	Recall and use subtraction facts to 20 fluently \square And derive and use related fact to 100	Subtract mentally using place value and number bonds, eg. 347-5, 34740, 347-100)
pictures, and missing number problems	Subtract using concrete objects, pictorial representations, (these include the 100 square, dienes, numicon and	KQ: KQ/language: See year 2 plus take and make, exchange, digit, value.
Recognise the – and = signs, and use these to read and write simple subtractions.	mentally, including a 2-digit number and ones, a 2-digit numbers and tens, and two 2-digit numbers)	hundreds
	Use inverse to check calculations.	
KQ/language: equal to, take, take-away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least count back, how many left, how much less is, difference, count on, strategy, partition, tens and ones	KQ/language: See year 1 plus difference, count on, strategy, partition, column, tens and ones	

Year 1	Subtraction Year 2	Year 3
Step 16-18	Step 19-21	Step 22-24
 - = signs and missing numbers in number sentences 7 - 3 = □ 7 - □ = 4 □ - 3 = 4 □ - ∇ = 4 Including missing signs 	<u>- = signs and missing numbers</u> Continue using a range of equations as in Year 1 but with appropriate numbers. Extend to balancing equations $14 + 5 = 20 - \Box$ Find a small difference by counting up 42 - 39 = 3 Use a number line/number grid/fingers etc	 <u>- = signs and missing numbers</u> Continue using a range of equations as in Year 1 and 2 but with appropriate numbers and teach the children to consider the most appropriate method <u>Find a small difference by counting up</u> Continue as in Year 2 but with appropriate numbers a g
7 🗆 3= 4	Mentally subtract 9 or 11. Begin to add/subtract 19 or 21	102 - 97 = 5
Understand subtraction as 'take away' and comparing.	Subtract 9 or 11. Begin to add/subtract 19 or 21 35 - 9 = 26 Record by breaking the calculation down 37-12 37-10=27	Subtract mentally a 'near multiple of 10' to or from a three-digit number (rounding and adjusting) Continue as in Year 2 but with appropriate numbers e.g. 78 – 49 is the same as 78 – 50 + 1 Use known number facts and place value to subtract
I have saved 5p. The socks that I want to buy cost 11p. How much more do I need in order to buy the socks? +6 +6 +6 +6 +6 +6 +6 +6	 27- 2 =25 Continue on to the subtraction of 2, 2 digit numbers. e.g 37-26 	$97 - 15 \begin{array}{c} 2 \\ 82 \end{array} \\ -5 \end{array} \\ -10 \end{array}$
• Use practical and informal written methods to support the subtraction of a one-digit number from a one digit or two-digit number (and a multiple of 10 from a two-digit number for the more able) -5 -5 -6 11 If you have 8 sweets and eat 3, how many do you have left? Use the vocabulary related to addition and subtraction and symbols to describe and record addition and subtraction number sentences Recording by - drawing jumps on prepared lines - constructing own lines	26 30 37 Introduce to the inverse to check answers e.g 16- 4±42 +7 12+ 4=16 Expand on Year1 range of vocabulary Find the difference Decrease Teach the expanded method of subtraction using dienes (for children that are not ready for an abstract method). 70 5 -40 2 30 3	Continue standard column algorithm for subtraction, moving onto the expanded column method: 600 110 16 240' 20 % -300 50 8 300 60 8 -78 -57 21 Introduce decomposition (and in Y2) ($\frac{9}{3} - \frac{25}{68}$

Year 4 Sten 25-27	Subtraction Year 5 Sten 28-30	Year 6 Sten 31-33
Key skills	Key skills	Key skills
Mentally subtract any pair of two digit numbers.	Count backwards through zero, using negative numbers	Subtract mentally with confidence – where the numbers are less than 100 or the calculation relies upon simple
Subtract 3 digit numbers from 3 digit numbers using counting on, e.g. 426 – 278 by jumping along a line from 278 to 426	Add or subtract 0.1 or 0.01 to/from any decimal number with confidence, e.g. $5.83 + 0.01$ or $4.83 - 0.1$	subtraction and place value. Examples include: $6,723 - 400, 72 - 46, 100 - 64$
Practise mental subtraction strategies, eg. Round and adjust (37—9), using place value	Children need to utilise and consider a range of subtraction strategies, jottings and written methods before choosing how to calculate	Subtract large numbers using column subtraction or counting up, e.g. 1323 – 758
Use counting on in the context of money and also when subtracting from numbers ending in zeros eg 4000-372	Subtract larger numbers using column subtraction or by counting up	Subtract decimal numbers using counting up
Count backwards through zero, using negative numbers	Begin to subtract decimal numbers using counting up: 6.2	across zero
KQ/language: See year 1, 2 and 3 plus inverse	 - 3.5 Decide which mental methods to use and explain why 	subtraction strategies, jottings and written methods before deciding how to calculate
	KQ/language: See year 1, 2 and 3 plus tenths, hundredths, decimal point, decimal	Decide which methods to use and explain why KQ/language: All from years 1, 2, 3, 4, 5, (equal to, take, take-away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least count back, how many left, how much less is, difference, count on, strategy, partition, tens units, take and make, exchange, digit, value, hundreds, inverse, tenths, hundredths, decimal point, decimal).



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Multiplication		
Year 1 Step 16-18	Year 2 Sten 19-21	Year 3 Sten 22-24
Key skills	Key skills	Key skills
Key skills Count in multiples of 2, 5 and 10 Recognise doubles to double 6 Solve simple one-step problems involving multiplication and division, calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. KQ/language: Groups of, lots of, times, array, altogether, multiply, count	 Key skills Count in steps of 2, 3 and 5 from zero and in 10s from any number Know the 2X, 5X and 10X tables and begin to say how many 10s are in 40 or how many 5s are in 30; recognise odd and even answers Write and calculate number statements using x and = signs Show that multiplication can be done in any order Solve a range of problems involving multiplication, using concrete objects, arrays, repeated addition, numicon, mental methods and multiplication facts KQ/language: See year 1, plus multiplied by, repeated addition, column, row, sets of, equal groups, times as big as, once, twice, three times 	 Key skills Understand that multiplication is commutative, e.g. 4 x 8 is the same as 8 x 4. Know the 2x, 3x, 5x and 10x times tables. All tables need to be learned to 12th multiple. Multiply any 2-digit number by 10 or a single-digit number by 100; Understand the effect of multiplying whole numbers by 10 and 100. Multiply a 1 digit number by a 2 digit number starting to use the grid Solve multiplication problems involving missing numbers Introduce KQ/language: See year 1 and 2, plus partition, grid method, multiple, product, tens, units, value Groups of, lots of, times, array, altogether, multiply, column, row, commutative, sets of, times Emphasis: Write and calculate mathematical statements for multiplication and division using the multiplication tables they know, including for two-digit numbers times one digit numbers, using mental and progressing to written method. Count in 3, 4 and 8s from any number.

Multiplication		
Year 1 Step 16-18	Year 2 Step 19-21	Year 3 Step 22-24
Multiplication is related to doubling and counting groups of the same size.	$x = signs and missing numbers$ $7 \times 2 = \Box$ $= 2 \times 7$ $7 \times = 14$ $14 = \Box \times 7$ $x \times 2 = 14$ $14 = 2 \times \Box$ $x \nabla = 14$ $14 = \Box \times \nabla$	Make reference to prvious methods from years 1 and 2 to ensure children are secure and are capable of using concrete resources.
Looking at columnsLooking at rows2 + 2 + 23 + 33 groups of 22 groups of 3	<u>Arrays and repeated addition</u> Multiply using arrays and repeated addition.	<u>x = signs and missing numbers</u> Continue using a range of equations as in Year 2 but with appropriate numbers.
Counting using a variety of practical resources Multiply with concrete objects, arrays and pictorial representations. Count in 2s, 5s, 10s $2^{2} + 2^{2}$	2 x 4 or 2 + 2 + 2 + 2 Starting from zero, make equal jumps on a number line to work out multiplication facts and write multiplication. Use $0.5 \times 10 \times 15 \times 20$ re-	Arrays and repeated addition Continue to understand multiplication as repeated addition.
$\Box + \Box = \Box$ Use numicon to find doubles to 6 (see above) Use visual and concrete arrays and 'sets of objects 'to find the answers to '3 lots of 4', '2 lots of 3' etc, $\Box = \Box = \Box$	peated addition on a number line: Use arrays and numicon to help children understand the commutative law. • • • • 4 x 2 or 4 + 4 • • • • • • • Partition Children need to be secure with partitioning numbers into 10s and 1s and partitioning in different ways: $6 = 5 + 1$ so e.g. Double 6 is the same as double five add double one. AND double 15	Using these visual examples above alongside mental and written methods to scaffold. For the example far right, line up numbers below rather than across so it is easier to add up the total at the end. Multiplying by 10 and 100 including decimals Make use of place value charts and hundred squares.
Pictures / marks There are 3 sweets in one bag. How many sweets are there in 5 bags? Introduce to simple word problems with no pictures. E.g One jug holds 6 cups of juice. How many cups of orange juice do two jugs hold or how many legs will three teddies have?	10 + 5 $20 + 10 = 30$ Introduce to partitioning e.g 15x5 5x5=25 10x5=50 25+50=75 Use arrays and numicon to help children understand the commutative law.	$\begin{array}{ l l l l l l l l l l l l l l l l l l l$

Year 4 Step 25-27	Multiplication Year 5 Step 28-30	Year 6 Sten 31-33
Key skills	Key skills	Key skills
Multiply 1 and 2 digit numbers by 10, 100 and 1000; to understand place value in decimal numbers with one place. Know and recite 2x, 3x, 4x, 5x, 9x, 10x times tables up to 12th multiple; include multiplying by 0 (e.g. 5 x 0 = 0, 7 x 0 = 0) or by 1 (e.g. 5 x 1 = 5, ½ x 1 = ½). Multiply 1- digit numbers by 2-digit or friendly 3-digit numbers using efficient written methods, alongside the previous method (grid method) to remind children how we partition. Find doubles to double 100 and beyond, using partitioning Begin to double amounts of money Use doubling as strategy for multiplying by 2, 4, 8 Count in multiples of 6, 7, 9, 25 and 1000 KQ/language: See year 1, 2 and 3, plus inverse.	Know and recite all times tables including division facts. Multiply 2- and 3-digit numbers using short and long multiplication Identify multiples and factors, using knowledge of multiplication tables up to 12 x 12 Scale up or down by a factor of 2, 5 or 10 Multiply integers and decimals by 10, 100, 1000 Recognise and use squared, cubes and their notations KO/language: See year 1, 2, 3 and 4 plus square, factor, integer, decimal, short/long multiplication, 'carry'/(to regroup)	 Recall multiplication facts up to 12 x 12 Use short multiplication to multiply a 1-digit number by a number with up to 4 digits Use long multiplication to multiply a 2-digit by a number with up to 4 digits Use short multiplication to multiply a 1-digit number by a number with one or two decimal places, including amounts of money. Multiply fractions and mixed numbers by whole numbers. Multiply fractions by proper fractions. Use percentages for comparison and calculate simple percentages. Estimate answers using rounding and approximation KQ/language: All from years 1, 2, 3, 4, 5, (equal to, take, take-away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least count back, how many left, how much less is, difference, count on, strategy, partition, tens units, take and make, exchange, digit, value, hundreds, inverse, tenths, hundredths, decimal point, decimal). plus

Year 4 Step 25-27	Multiplication Year 5 Step 28-30	Year 6 Step 31-33
Continue to consolidate efficient written methods alongside previous visual resources. For multiplying a 2 or 3 digit number by a 1 digit number, set out as follows: 14 X6 20 60 84 8 For multiplying a 2-digit number by a 2-digit number. Firstly, 6 × 24 = Then 10 × 24 = 2 2 4 2 4 2 4 2 4 2 4 3 4 2 4 2 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4	Continue to consolidate efficient written methods alongside previous visual resources.372 $X3$ 1116 2Extend to simple decimals with one decimal place.1 2 3 4 $*$ 1 6 7 4 0 4 (1234 × 6) 1 2 3 4 0 (1234 × 10)1 9,7441 9,744Use short multiplication to to multiply numbers with more than 4 digits by a single digit; to multiply money and measures; and to multiply decimals up to 2 decimal places by a single digitUse long multiplication to multiply numbers with at least 4 digits by a 2-digit number 35.6 	Continue to consolidate efficient written methods alongside previous visual resources. Pencil and paper procedures Extend to decimals with up to two decimal places. 324.86 X4 1299.44 13 2 Continue efficient column method from previous year introduce to column method for multiplying a 4 digit number by a 2 digit number 3472 X 28 7776 69440 72 16

Division				
Year 1 Step 16-18	Year 2 Step 19-21	Year 3 Step 22-24		
Key skills	Key skills	Key skills		
Use lots of practical apparatus, arrays and picture representations Be taught to understand the difference between "grouping" objects (How many groups of 2 can you make?) and "sharing" (Share these sweets between 2 people) Be able to count in multiples of 2s, 5s and 10s. Find half of a group of objects by sharing into 2 equal groups. KQ/language share, share equally, one each, two each, group, groups of, lots of, array	 Count in steps of 2, 3, and 5 from 0 Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers. Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the x, ÷ and = signs. Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot. Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts KQ/language: See year 1 plus divide, divided by, divided into, division, grouping, number line, left, left over 	 Recall and use division facts for the 2, 3, 4, 5, 8 and 10 multiplication tables Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers divided by one digit Solve problems, in contexts, and including missing number problems, involving division. Pupils develop efficient mental methods, for example, using division facts (e.g. using 3 × 2 = 6, 6 ÷ 3 = 2 and 2 = 6 ÷ 3) to derive related facts (30 × 2 = 60, so 60 ÷ 3 = 20 and 20 = 60 ÷ 3). Pupils develop reliable written methods for division, starting with calculations of 2digit numbers by 1-digit numbers. Halve even numbers up to 50 and multiples of ten to 100 Perform divisions within the tables including those with remainders, e.g. 38 ÷ 5. KQ/language: See year 1 and 2 plus inverse, short division, 'carry', remainder, multiple 		

Year 1 Step 16-18	Division Year 2 Step 19-21	Year 3 Step 22-24
Count back in 5s Coun	How many socks will we need for three bears? (Through role play for example) Sorting objects into groups Problem solving – we have got 4 biscuits, how can we share them out equally	÷ = signs and missing numbers Continue using a range of equations as in Year 2 but with appropriate numbers.
Grouping:	$\begin{array}{c} \div = signs and missing numbers \\ 6 \div 2 = \Box \qquad \Box = 6 \div 2 \\ 6 \div \Box = 3 \qquad 3 = 6 \div \Box \\ \Box \div 2 = 3 \qquad 3 = \Box \div 2 \\ \Box \div \nabla = 3 \qquad 3 = \Box \div \nabla \\ Including missing signs \end{array}$	<u>Understand division as sharing and grouping</u> 18 ÷ 3 can be modelled as: Sharing – 18 shared between 3 (see Year 1 diagram)
Sharing:	$6 \square 2 = 3$ $Grouping$ Link to counting and understand 3 groups and Count up to 100 objects by grouping them and counting in	OR Grouping - How many 3's make 18?
12 shared between 3 is 4 Recognise, find and name a half as one of two-equal parts of an object, shape or quantity. Recognise, find and name a quarter as one of four-equal parts of an object, shape or quantity. Sharing – 6 sweets	tens, fives or twos; Find one half, one quarter and three quarters of shapes and sets of objects 6 ÷ 2 can be modelled as: There are 6 strawberries.	0 3 6 9 12 15 18
are shared between 2 people. How many do they have each?	How many people can have 2 each? How many 2s make 6? 6 ÷ 2 can be modelled as:	Introduce to "bus stop" method for simple calculations e.g 48 divided by 2 2 4
Practical activities involving sharing, distributing cards when playing a game, putting objects onto plates, into		2 4 8 (see year 4)
Six sweets are shared between two people. How many do they get each. Grouping	In the context of money count forwards and backwards using 2p, 5p and 10p coins Practical grouping e.g. in PE	<u>Remainders</u> $16 \div 3 = 5 r1$ 5haring - 16 shared between 3, how many left over? Grouping - How many 3's make 16 how many left over?
Sorting objects into 2s / 3s/ 4s etc How many pairs of socks are there?	12 children get into teams of 4 to play a game. How many teams are there?	e.g.
There are 12 crocus bulbs. Plant 3 in each pot. How many pots are there? Jo has 12 Lego wheels. How many cars can she make?		

Year 4 Step 25-27	Division Year 5 Step 28-30	Year 6 Step 31-33
Key skills	Key skills	Key skills
Use a written method to divide a 2-digit or a 3-digit number by a single-digit number.	Recall multiplication and division facts for all numbers up to 12 x 12 (as in Y4).	Recall and use multiplication and division facts for all numbers to 12 x 12 for more complex calculations
Give remainders as whole numbers. Recall multiplication and division facts for all numbers up to 12 x 12. Use place value, known and derived facts to multiply and divide mentally, including: multiplying and dividing by 10 and 100 and 1. Pupils practise to become fluent in the formal written method of short division with exact answers when dividing by a one-digit number Pupils practise mental methods and extend this to three- digit numbers to derive facts, for example $200 \times 3 = 600$ so $600 \div 3 = 200$ Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. This should include correspondence questions	 Multiply and divide numbers mentally, drawing upon known facts. Identify multiples and factors, including finding all factor pairs of a number, and common factors of two number. Solve problems involving multiplication and division where larger numbers are decomposed into their factors. Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. Use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. Work out whether a number up to 100 is prime, and recall prime numbers to 19 Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret 	 Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context. Use short division where appropriate. Perform mental calculations, including with mixed operations and large numbers. Identify common factors, common multiples and prime numbers. Solve problems involving all 4 operations. Use estimation to check answers to calculations and determine accuracy, in the context of a problem. Use written division methods in cases where the answer has up to two decimal places.
such as three cakes shared equally between 10 children. Short KQ/language See year 1, 2 and 3 plus divisible by, factor	remainders appropriately for the context Use multiplication and division as inverses. Interpret non- integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding (e.g. $98 \div 4 = 24 \text{ r } 2 = 241/2 = 24.5 \approx 25$) KQ/language See year 1, 2, 3 and 4 plus quotient, prime number, prime factors, composite number (non-prime)	Solve problems which require answers to be rounded to specified degrees of accuracy. KQ/language See year all previous language (including share, share equally, one each, two each, group, equal groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, 'carry', remainder, multiple, divisible by, factor quotient, prime number, prime factors, composite number (non-prime) plus common factor.

Year 4 Step 25-27	Division Year 5 Step 28-30	Year 6 Step 31-33
$\frac{\cdot}{\cdot}$ = signs and missing numbers Continue using a range of equations as in Year 2 but with appropriate numbers.	 ÷ = signs and missing numbers Continue using a range of equations as in Year 2 but with appropriate numbers. 	 ÷ = signs and missing numbers Continue using a range of equations as in Year 2 but with appropriate numbers.
Sharing and grouping 30 ÷ 6 can be modelled as: grouping – groups of 6 placed on no. line and the number of groups counted e.g.	Sharing and grouping Continue to understand division as both sharing and grouping (repeated subtraction).	Sharing and grouping Continue to understand division as both sharing and grouping (repeated subtraction).
$\begin{array}{c} +6 +6 +6 +6 +6 +6 \\ \hline 0 & 6 \\ \hline 12 & 18 \\ \hline 24 & 30 \\ \end{array}$ Sharing – sharing among 6, the number given to each person	<u>Remainders</u> Remind of the need to use remainders in some contexts Quotients expressed as fractions or decimal fractions $61 \div 4 = 15 \frac{1}{4}$ or 15.25	<u>Remainders</u> Quotients expressed as fractions or decimal fractions $676 \div 8 = 84.5$
Short division TU + U	Pencil and paper procedures	Pencil and paper procedures
72 ÷ 3 $ \begin{array}{c} 3) 72 \\ -30 \\ -30 \\ 12 \\ -6 \\ -6 \\ 2x \end{array} $ $ \begin{array}{c} 14 \text{ remainder 2} \\ 5)72 \\ -50 \\ 22 \\ -60 \\ 22 \\ -60 \\ 2x \end{array} $	Consolidate short division method "bus stop method" progress to decimal remainders and division by a 2 digit number	Continue to develop "bus stop" method" -with decimals -with 2 digit numbers where appropriate $23 \times 2 = 46$
Answer: 24	0145 25	$23 \times 5 = 115$ 23 × 10 - 230
Pencil and paper procedures Short division: 1 4.6 3 5 5 1 1.0 Recap and consolidate to "bus stop method"	$8 1^{1} 1^{3} 6^{4} 2 . {}^{2} 0^{4} 0$	$23 \times 10 = 230$ $\begin{array}{c} 27 \\ 36 \overline{\smash{\big)}\ 972} \\ -\underline{720} \\ 252 \\ -\underline{252} \\ 0 \end{array}$ $\begin{array}{c} 20x \\ 7x \\ -\underline{7x} $
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		