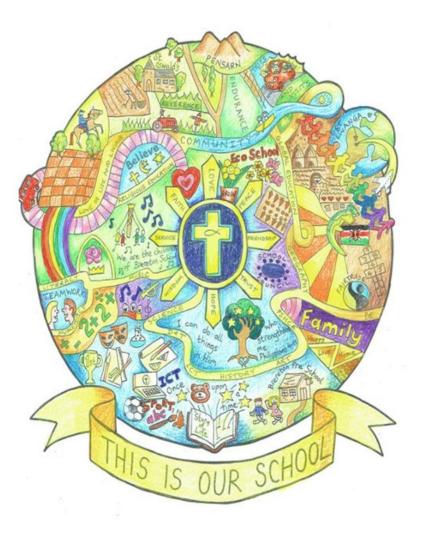


Chester Diocesan Academies Trust

Year 3

Maths Calculation Policy



Addition

Year 3	 Add numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds. Add numbers with up to three digits, using formal written methods of columnar addition. Add fractions with the same denominator within 1 whole. Calculate the time taken by particular events or tasks. 			
Progression of skills	Key representations			
Add 1s, 10s or 100s to a	The ones/tens/hundreds colu	mn will increase by	What patterns	do you notice?
3-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	HundredsTensOnesHundredsIIIIIIIIHundredsIIIIIHundredsIIIIIIHundredsIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	H T O Image: Constraint of the state of	235 + 3 = 235 + 30 = 235 + 300 = 604 + 20 = 604 + 50 = 604 + 90 + 90 = 604 + 90 = 604 + 90 = 604 + 90 = 604 + 90 = 604 + 90 = 604	$111 + \boxed{ = 118} \\ 111 + \boxed{ = 181} \\ 111 + \boxed{ = 811} $
Add two numbers	ones + ones = ones			?
(no exchange)	\dots tens + \dots tens = \dots tens \dots hundreds + \dots hundreds = \dots	hundreds	345	432
Mental strategies and introduction of formal written method.		Hundreds 345 432	Tens Ones Image: Construction of the second s	H T O 3 4 5 + 4 3 2 - - - -

Addition



Progression of skills	Key representations
Add two numbers across a 10 or 100 Formal written method involving up to 2 exchanges including 3-digit plus 2-digit numbers.	There are ones, so I do/do not need to make an exchange. There are tens, so I do/do not need to make an exchange. ones = ten and ones. tens = hundred and tens. 255 54
Complements to 100 Pairs of numbers which total 100	plus is equal to 100 $ \begin{array}{c} 1 \text{ add } \dots \text{ to get to the next 10, then } \dots \text{ to get to 10} \\ 100 \\ 38 \\ 38 \\ 7 \end{array} $ $ \begin{array}{c} 38 + 62 = 100 \\ 62 + 38 = 100 \\ 100 = 38 + 62 \\ 100 = 62 + 38 \end{array} $

Addition



Progression of skills	Key representations
Add fractions with the same denominator within 1 whole Make links with known facts.	When adding fractions with the same denominator, I only add the numerator. fifths + fifths = fifths 1 + 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 =
Calculate the duration of events Find durations of time between a given start and end point. Children will need to calculate complements to 60	From to o'clock is minutes. From o'clock to is minutes. The total time taken is minutes. $ \underbrace{4:25}_{\text{finish}} \underbrace{4:55}_{\text{finish}} \underbrace{2:25}_{3:00} \underbrace{3:18}_{3:18} $

Subtraction



Year 3	 Subtract numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds. Subtract numbers with up to three digits, using formal written methods. Subtract fractions with the same denominator within 1 whole. 		
Progression of skills	Key representations		
Subtract 1s, 10s and 100s from a 3-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	The ones/tens/hundreds column will decrease byH T OImage: Second Secon	What patterns do you notice? $235 - 3 =$ $235 - 30 =$ $235 - 300 =$ $118 624 - 20 =$ $654 - 50 =$ $694 - 90 =$ $811 =$ $235 - 300 =$ $235 - 300 =$ $=$	
Subtract two numbers (no exchange) Mental strategies and introduction of formal written method.		769 147 ? ndreds Tens Ones Q	

Subtraction



Progression of skills	Key representations	
Subtract two numbers across a 10 or 100 Formal written method involving up to 2 exchanges including 3-digit subtract 2-digit numbers.	I need to subtract ones. I do/do not need to I need to subtract tens. I do/do not need to I can exchange 1 for 10 $\boxed{72}_{45}$? $\boxed{100}_{2}$	U U
Complements to 100	100 minus is equal to	I subtract tens, then I subtract ones.
Focus on subtraction facts. Encourage children to notice patterns.		100 - 38 = 62 $100 - 62 = 38$ $62 = 100 - 38$ $38 = 100 - 62$ $38 = 100 - 62$

Subtraction



Progression of skills	Key representations
Subtract fractions with the same denominator within 1 whole	When subtracting fractions with the same denominator, I only subtract the numerator. fifths – fifths $\frac{7}{5} - \frac{1}{5}$
Make links with known facts.	$\frac{4}{5} - \frac{1}{5}$
	$\frac{3}{5} - \frac{1}{5}$

Year 3	 Recall and use multiplication facts for the 3, 4 and 8 multiplication tables. Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. Solve problems, including missing number problems, involving multiplication, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects. 		
Progression of skills	Key representations		
The 3 times-table Encourage daily counting in multiples both forwards and back.	groups of $3 =$ $\times 3 =$ 3, times = $3 \times =$ 3 3 3 3 3	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
The 4 times-table Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2 and 4 times-tables.	$\begin{array}{c} \dots \text{ groups of } 4 = \\ \dots \times 4 = \\ 4, \dots \text{ times } = \\ 4 \times \dots = \end{array} \qquad \qquad$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	



Progression of skills	Key representations
The 8 times-table	lots of 8 = times 8 is equal to
Encourage daily counting in multiples both forwards and	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
back. Encourage children to notice links between the 2, 4 and 8 times-tables.	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
Related facts Use knowledge of multiplying by 10 to scale times-table facts.	\times ones is equal to ones so \times tens is equal to tens. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Multiply a 2-digit number by a 1-digit number - no exchange Children apply their understanding of partitioning to represent and solve calculations using the expanded method.	In tens multiplied by is equal to tens.Image: Image: I

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Progression of skills	Key representations	
Multiply a 2-digit number by a 1-digit number - with exchange Children apply their understanding of partitioning to represent and solve calculations using the expanded method.	tens multiplied by is equal to tens.Tens OnesTens OnesCones <th< th=""><th>45×3 40×3 5×3 $\boxed{10000}$ 100</th></th<>	45×3 40×3 5×3 $\boxed{10000}$ 100
Scaling Children focus on multiplication as scaling (times the size) as opposed to repeated addition.	There are times as many as 2 $\triangle \triangle \triangle \triangle \triangle \triangle 2 2 2$ There are 3 times as many triangles as circles.	 is times the size of is times the length/height of 4 cm 16 cm Miss Smith is twice the height of Jo.



Progression of skills	Key representations			
Correspondence problems (How many ways?)	For every , there are possible There are \times possibilities altogether.			
		hats	scarves	
Encourage children to work systematically to find all the		blue 🍂	ALLER AND	For every hat, there are two possible
different possible combinations.		orange 為	ALL OF	scarves. $3 \times 2 = 6$
		purple 🚔		There are 6 possibilities altogether.



Year 3	 Recall and use division facts for the 3, 4 and 8 multiplication tables. Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. 		
Progression of skills	Key representations		
Divide by 3 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are groups of 3 in \div 3 = $2 \times 3 = 6$ $6 \div 3 = 2$ 0 1 2 3 $2 \times 3 = 6$ $6 \div 3 = 2$	has been shared equally into 3 equal groups. $\div 3 =$ $2 \times 3 = 6$ $6 \div 3 = 2$ $6 \div 6$ 2×2 $2 \times 3 = 6$ $6 \div 3 = 2$	
Divide by 4 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are groups of 4 in $\div 4 =$ $2 \times 4 = 8$ $8 \div 4 = 2$ 0 1 2 3 4 5 6 7 8	has been shared equally into 4 equal groups. $\div 4 =$ $2 \times 4 = 8$ $8 \div 4 = 2$ $8 = 8$ $2 = 2$	



Progression of skills	Key representations	
Divide by 8 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are groups of 8 in $\div 8 =$ $2 \times 8 = 16$ $16 \div 8 = 2$ $0 \times 8 = 16$	has been shared equally into 8 equal groups. $\div 8 =$
		8 $2 \times 8 = 16$ $16 \div 8 = 2$
Related facts	$\dots \div \dots$ is equal to \dots , so \dots tens $\div \dots$ is equal to \dots tens.	
Link to known times-table facts.		$\begin{array}{c} 1 & 1 & 1 \\ \hline 1 & 1 \\ \hline$
Divide a 2-digit number by a 1-digit number - no	tens divided by is equal to tens. ones divided by is equal to ones.	
exchange Partition into tens and ones to divide and then recombine.	Tens Ones $60 \div 2 = 3$ $4 \div 2 = 2$ $64 \div 2 = 3$	



Progression of skills	Key representations	
Divide a 2-digit number by a 1-digit number - with remainders Encourage children to partition numbers flexibly to help them to divide more efficiently.	Tens divided by is equal to tens ones divided by is equal to ones.TensOnes96 \div 480 \div 416 \div 496 \div 496 \div 496 \div 4	There are groups of There are remaining. $31 \div 4 = 7 r3$ 4 = 7 r3 4 = 7 r3 7 = 11 = 15 = 19 = 23 = 27 = 31 $94 \div 4 = 23 r2$ 1 = 15 = 19 = 23 = 27 = 31 1 = 15 = 19 = 23 = 27 = 31 1 = 15 = 19 = 23 = 27 = 31 1 = 15 = 19 = 23 = 27 = 31 1 = 15 = 19 = 23 = 27 = 31 1 = 15 = 19 = 23 = 27 = 31 1 = 15 = 19 = 23 = 27 = 31 1 = 15 = 19 = 23 = 27 = 31 1 = 15 = 19 = 23 = 27 = 31 1 = 15 = 19 = 23 = 27 = 31 1 = 15 = 19 = 23 = 27 = 31 1 = 15 = 19 = 23 = 27 = 31 1 = 15 = 19 = 23 = 27 = 31 1 = 15 = 10 = 10 1 = 15 = 10 = 10 1 = 15 = 1
Unit fractions of a set of objects Bar models are useful to show the link between division and fractions, for example, dividing by 3 and finding a third.	The whole is divided into equal parts. Each part is $\frac{1}{0}$ of the whole. 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 +	One of is $\frac{1}{4}$ of 12 is 3 $\frac{1}{3}$ of 36 is 12 13 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1



Progression of skills	Key representations	
Non-unit fractions of a set of objects Bar models are a useful representation and show the links with division and multiplication.	The whole is divided into equal parts. Each part is $\frac{1}{0}$ of the whole. 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 +	$\frac{1}{2} \text{ of } \dots \text{ is } \dots, \text{ so } \xrightarrow{1} \text{ of } \dots \text{ is } \dots$ $\frac{3}{4} \text{ of } 12 \text{ is } 9$ $\frac{2}{3} \text{ of } 36 \text{ is } 24$ $10 \text{ 1 } 10 \text{ 1 } 10 \text{ 1 } 1$