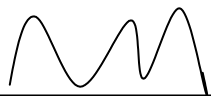
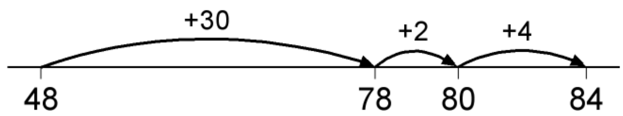
CALCULATION POLICY – Chad Varah Primary

These are the methods that we teach at school. Different year groups teach different methods and the policy shows how the methods change as the children move through the school.

(In all years concrete resources are used alongside 'paper methods' to ensure a thorough understanding of abstract concepts.)

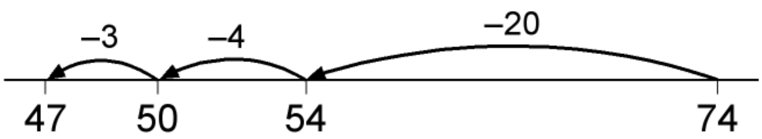
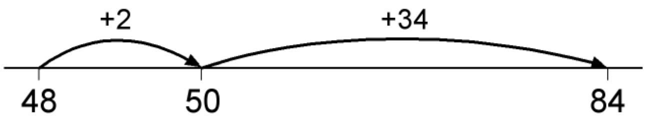
Addition

The different stages	***Example of what it looks like***
Stage 1 Counting sets of objects	
Stage 2 Combining 2 sets of objects into 1 group and counting practically.	For example for 6+2= the children may get 6 cubes, then 2 more and count how many altogether.
Stage 3 Drawing pictures/dots – informal jottings. Then counting how many altogether..	4 + 2 = 6 * * * * + * *
Stage 4 Counting on, on a number line with numbers on it.	6 + 3 = 9  1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10
Stage 5 Steps in addition can be recorded on a number line. The steps often bridge through a multiple of 10. 1) Partition the smaller number into tens and units 2) Add on the tens. 3) Add on the units.	8 + 7 = 15  48 + 36 = 84 30 6 

Stage 6 Partitioned numbers are then written under one another:	$\begin{array}{rcl} 47 & = & 40 + 7 \\ +\underline{76} & & \underline{70 + 6} \\ & & 110 + 13 = 123 \end{array}$
Stage 7 Write the numbers in columns. Add the tens first:	$\begin{array}{r} 47 \\ +\ \underline{76} \\ 110 \\ \underline{13} \\ 123 \end{array}$
Adding the units first:	$\begin{array}{r} 47 \\ +\ \underline{76} \\ 13 \\ \underline{110} \\ 123 \end{array}$
Stage 8 This then becomes the shorter method where numbers get carried into the next column.	$\begin{array}{r} 47 \\ +\ \underline{76} \\ \underline{123} \\ 1\,1\ \end{array}$
Stage 9 Later, move to adding three two-digit numbers, two three-digit numbers and numbers with different numbers of digits.	$\begin{array}{r} 258 \\ +\ \underline{87} \\ \underline{345} \\ 1\,1\ \end{array}$

CALCULATION POLICY – Chad Varah Primary

Subtraction

Stage 1 Practical	Practically get a group of objects and take some away.
Stage 2 Jottings Draw a set of objects and then cross some out.	11 – 4 = 7 ~~*~~ ~~*~~ ~~*~~ ~~*~~ * * * * * * *
Stage 3 Count back on a number line with numbers on.	13 – 4 = 9 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15
Stage 4 Using a number line 74 – 27 = 47 worked by counting back: Also working out the difference by counting on	 Work out the difference between 48 and 84 = 36 

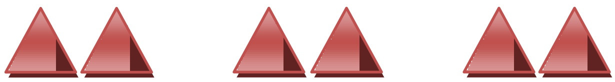
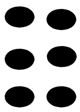
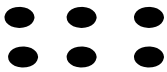
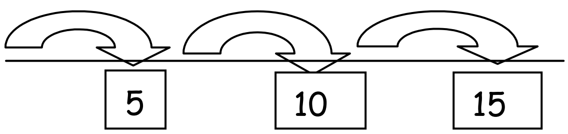
CALCULATION POLICY – Chad Varah Primary

Stage 5 Partitioned numbers are then written under one another: This is how we start introducing the column subtraction method	74 – 23 = $\begin{array}{r} 7\ 0 + 4 \\ -\ 2\ 0 + 3 \\ \hline 5\ 0 + 1 \end{array} \quad = 5\ 1$
Stage 6 **(Exchange for 2 digit numbers)** These show the 2 steps which lead to the shortened version of the column subtraction method. We always start with the units number.	74 – 27= $\begin{array}{r} 70 + 4 \\ -\ 20 + 7 \\ \hline \end{array} \qquad \begin{array}{r} \overset{60}{\cancel{70}} + \overset{14}{\cancel{4}} \\ -\ 20 + 7 \\ \hline 40 + 7 \end{array} \qquad \begin{array}{r} \overset{6}{\cancel{7}}\ \overset{14}{\cancel{4}} \\ -\ 2\ 7 \\ \hline 4\ 7 \end{array}$
Stage 7 **(Exchange for 3 digit numbers)** The same method but for bigger numbers still starting with the units number.	$\begin{array}{r} 700 + 40 + 1 \\ -\ 300 + 60 + 7 \\ \hline \end{array} \qquad \begin{array}{r} \overset{600}{\cancel{700}} + \overset{130}{\cancel{40}} + \overset{11}{\cancel{1}} \\ -\ 300 + 60 + 7 \\ \hline 300 + 70 + 4 \end{array} \qquad \begin{array}{r} \overset{6}{\cancel{7}}\ \overset{13}{\cancel{4}}\ \overset{11}{\cancel{1}} \\ -\ 3\ 6\ 7 \\ \hline 3\ 7\ 4 \end{array}$
Stage 8 **(Exchange for 4 digits including 0)**	4000 900 100 ~~5000 + 000~~ + 00 ~~+ 8~~ - 1000 + 200 + 50 + 7 3000 + 700 + 50 + 1 $\begin{array}{r} \overset{4}{5}\ \ \overset{\overset{9}{\cancel{10}}}{0}\ \ \overset{10}{0}\ \ 8 \\ -\ 1\ \ 2\ \ 5\ \ 7 \\ \hline 3\ \ 7\ \ 5\ \ 1 \end{array}$

Multiplication

Year 1	2 times table 5 times table 10 times table
Year 2	2 times table 3 times table 5 times table 10 times table 11 times table
Year 3	Add 4, 6 and 8 times table
Year 4	Derive and recall multiplication and division facts for all tables up to 10 x 12

Within this teach how to know facts i.e.
6 x 4 is 5 x 4 and then 1 x 4
9 x 4 is 10 x 4 and then take away 4

Stage 1 Counting practically in repeated groups/patterns	
Stage 2 Grouping	3 x 2 = 6 
Stage 3 Arrays	3 x 2 = 6 or 2 x 3 = 6  
Stage 4 **Repeated addition** 5 times 3 is 5 + 5 + 5 = 15 or 3 lots of 5 or 5 x 3 Repeated addition can be shown easily on a number line.	5 x 3 = 5 + 5 + 5 5 5 5 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 

Stage 5

Partitioning

13 x 5 =
10 x 5 = 50   3 x 5 = 15
50 + 15 = 65

Stage 6 The grid method
It is better to place the number with the most digits in the left-hand column of the grid so that it is easier to add the answers of each part of the multiplication together.
7 x 38 =

×	7
30	210
8	56
	266

Stage 7: Multiplying two, two digit numbers This follows the same steps as the first grid method but for 2 digit numbers.

×	20	7	
50	1000	350	1350
6	120	42	162
			1512
			1

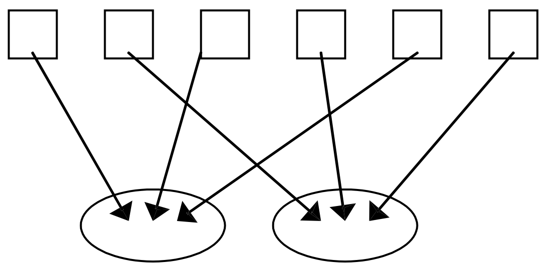
Division

<table>
<tr><td colspan="2">Deriving and recalling division facts

<table><tr><td>Year 2
2 times table
5 times table
10 times table</td><td>Year 3 3 times table
4 times table
5 times table
6 times table
8 times table
10 times table</td><td>Year 4
Derive and recall division facts for all tables up to 10 x 12</td></tr></table></td></tr>
<tr><td>Stage 1
Children will develop their understanding of division and use jottings to support calculation

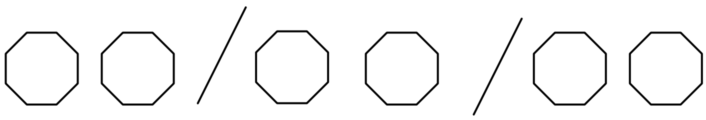
Or alternatively arrays can be used.</td><td>Sharing equally

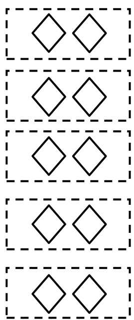
6 sweets shared between 2 people, how many do they each get?

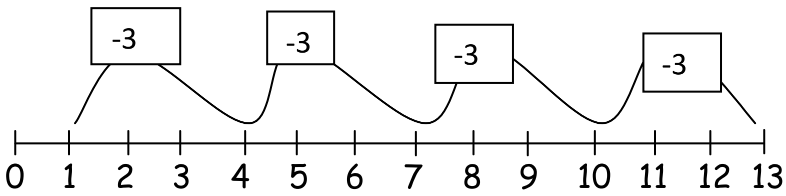
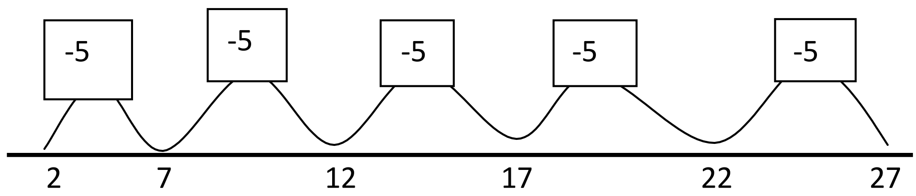
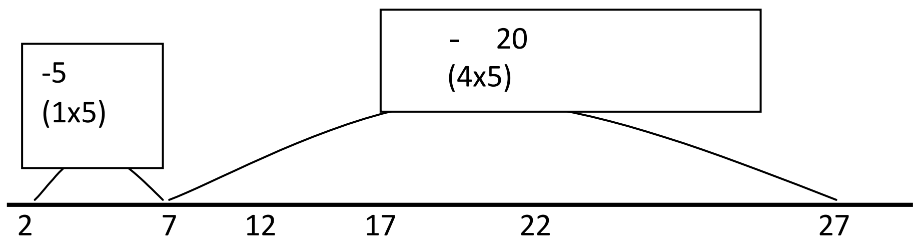


Grouping or repeated addition

There are 6 sweets, how many people can have 2 sweets each?


So 10 ÷ 2 = 5

</td></tr>
</table>

Stage 2 Children should also move onto calculations involving remainders through repeated subtraction.	**Repeated subtraction using a number line or bead bar** 13 ÷ 3 = 4r1 
Stage 3	Children will develop their use of repeated subtraction to be able to subtract multiples of the divisor. Initially, these should be multiples of 10s, 5s, 2s and 1s – numbers with which the children are more familiar. 27 ÷ 5 = 5r2 
Stage 4 Moving onto:	27 ÷ 5 = 5r2 

Stage 5 TU÷U Then onto the vertical method:	72 ÷ 3 3) 72 - 30 (10x3) 42 - 30 (10x3) 12 - 6 (2x3) 6 - 6 (2x3) 0 Answer : 24
Stage 6 HTU÷U Introduce subtracting larger multiples of ten. This is called chunking.	256 ÷ 7 7 | 2 5 6 - 7 0 1 0 X 7 1 8 6 - 1 4 0 2 0 X 7 4 6 - 4 2 6 X 7 4 36 r 4

Stage 7: Bus Stop Method	How many packs of 24 can we make from 560 biscuits? Start by multiplying 24 by multiples of 10 to get an estimate. As 24 × 20 = 480 and 24 × 30 = 720, we know the answer lies between 20 and 30 packs. $$\begin{array}{r} 2\;3\;r\;8 \\ 24\overline{)56^{8}0} \end{array}$$

Policy Agreed: February 2013

Review: February 2015

Reviewing Committee: Standards and Curriculum