
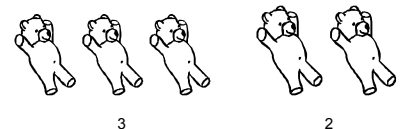


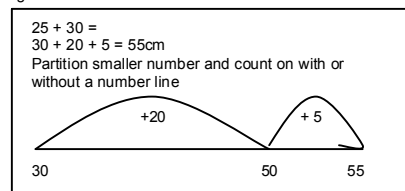
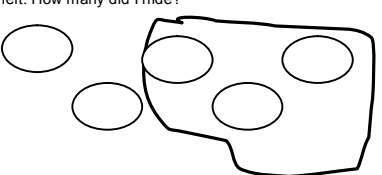
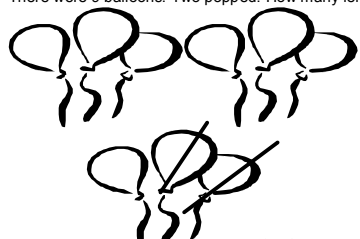
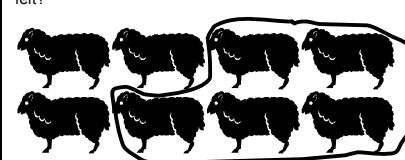
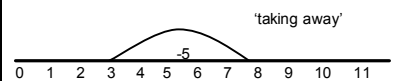
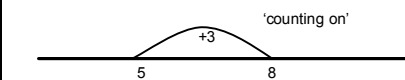
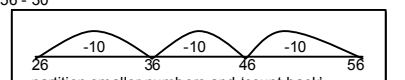
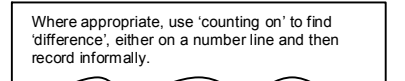




Policy on written calculations and use of the calculator

November 2006




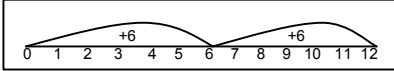
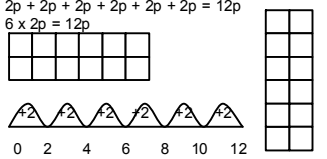


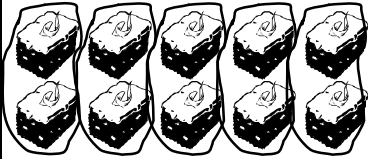
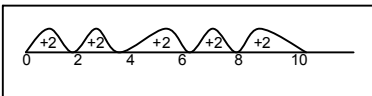
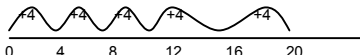
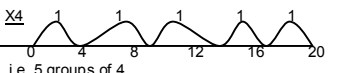
ADDITION			
Stage P (Pre school)	Stage 1	Stage 2	Stage 3
<p>I've got 2 sweets and I am given one more. How many have I got now?</p>  <p>Strategy: combining two groups and counting to establish total Recording: teacher demonstration of pictorial recording where appropriate. Vocabulary: more, and, make, sum, total, altogether Equipment: every day objects, counters, fingers</p>	<p>Jane had 3 bears. She was given 2 more. How many does she have now?</p>  <p>$3 + 2 = 5$</p> <p>Strategy: combining two or more groups and counting to establish total; 'counting on' from one number Recording: teacher demonstration of calculation to match pictorial recording using numberlines and use of standard notation of + and = Children begin using numberlines and standard notation when appropriate e.g. Summer term Vocabulary: add, more, and, make, sum, total, altogether Equipment: number lines, counters, fingers</p>	<p>Some hens lay 2 eggs, 4 eggs and 3 eggs. How many eggs did they lay altogether?</p>  <p>$4 + 3 + 2 =$</p>  <p>$4 + 3 + 2 = 9$</p> <p>Strategy: reordering to begin with largest number and counting on Recording: Children to continue to develop pictorial recording; use standard notation; using a tally and beginning to record on their own number line. Vocabulary: add, more, and, make, sum, total, altogether, plus, equals Equipment: number lines, counters, fingers; addition & subtraction facts ITP.</p>	<p>My cat is 25cm tall. My dog is 30cm taller. How tall is my dog?</p>  <p>$25 + 30 =$ $30 + 20 + 5 = 55\text{cm}$ Partition smaller number and count on with or without a number line</p> <p>Strategy: reordering to begin with largest number; partitioning other number(s) e.g. into tens and units; and counting on in tens and ones Recording: Children to continue to develop recording especially using their own number lines and standard notation to show partitioning and recombining. Vocabulary: add, more, and, make, sum, total, altogether, plus, addition Equipment: number lines, hundred squares, Base 10 material; addition & subtraction facts ITP.</p>

SUBTRACTION			
Stage P (Pre school)	Stage 1	Stage 2	Stage 3
<p>There were 5 beads but I hid some. You can see there are 3 left. How many did I hide?</p>  <p>Strategy: begin to recognise subtraction as 'taking away' and 'counting back'. Also compare two numbers to find 'difference'. Recording: teacher demonstration of appropriate pictorial recording where appropriate. Vocabulary: take away, leave, Equipment: every day objects, counters, fingers</p>	<p>There were 9 balloons. Two popped. How many left?</p>  <p>$9 - 2 = 7$</p> <p>Strategy: recognise subtraction as 'taking away' and 'counting back' on a numberline; compare two numbers to find difference e.g. as 'towers' Recording: teacher demonstration of calculation to match pictorial recording using numberlines and use of standard notation of - and =. Children begin using numberlines and standard notation when appropriate e.g. Summer term Vocabulary: take away, leave, how many are left, how many fewer than, difference between, Equipment: number lines, counters, fingers</p>	<p>My shepherd looks after 8 sheep. He has lost 5 how many left?</p>  <p>$8 - 5 = 3$</p> <p>'taking away'</p>  <p>'counting on'</p>  <p>Strategy: recognise subtraction as 'taking away' and 'counting back'; or 'counting on' as the most efficient way of finding 'difference'. Decide on most efficient strategy. Recording: Children to continue to develop pictorial recording; use standard notation; using a tally and beginning to record on their own number line to show take away as 'counting back'; teacher demonstration of difference as 'counting on' using numberlines. Vocabulary: take away, leave, how many are left, how many fewer than, difference between, how much more is....., subtract, minus, equals, less Equipment: number lines, counters, fingers; addition & subtraction facts ITP; Difference ITP</p>	<p>There are 56 bean bags. Kim takes 30. How many bean bags are left? $56 - 30$</p>  <p>partition smaller numbers and 'count back' either on a number line or record informally. $56 - 10 - 10 - 10 = 26$</p>  <p>Where appropriate, use 'counting on' to find 'difference', either on a number line and then record informally. Difference between 56 and 30 is $10 + 10 + 6 = 26$</p> <p>Strategy: recognise subtraction as 'taking away' and 'counting back'; recognise 'counting on' as the most efficient way of finding 'difference' Recording: Children to continue to develop recording especially using their own number lines and standard notation to show partitioning and recombining of one number. Vocabulary: take away, leave, how many are left, how many fewer than, difference between, how much more is....., subtract, minus, subtraction, less Equipment: number lines, hundred squares, Base 10 material; addition & subtraction facts ITP; Difference ITP</p>

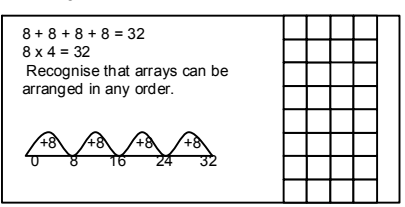
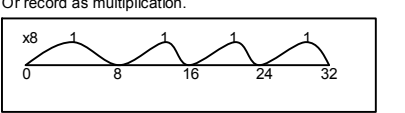
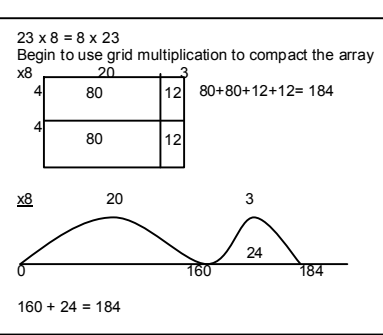
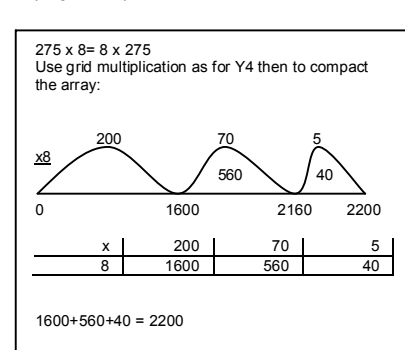
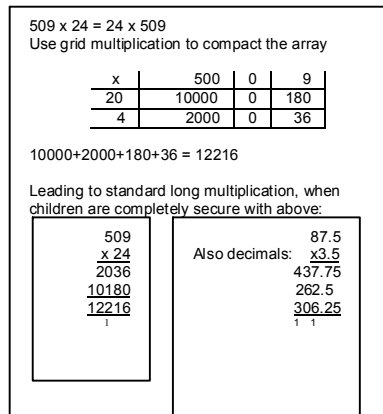
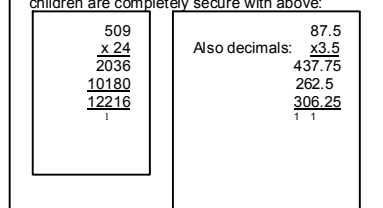
subtract, minus, subtraction
Equipment: number lines, hundred squares, Base 10 material

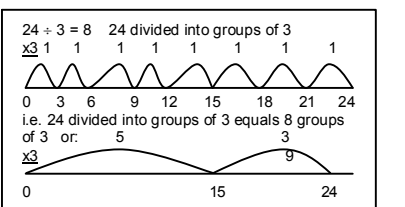
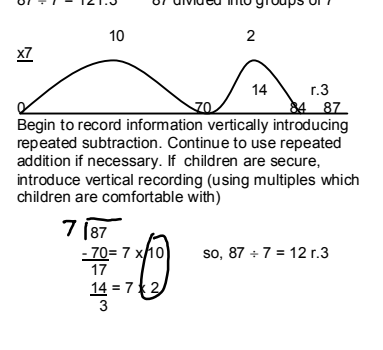
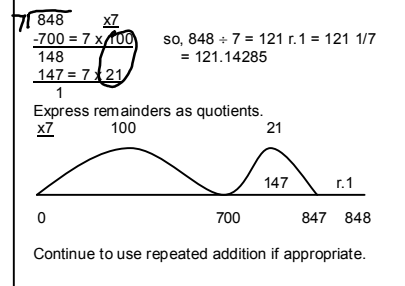
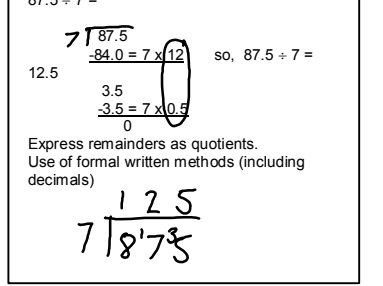
Equipment: number lines, Base 10 material

MULTIPLICATION AND DIVISION

MULTIPLICATION			
Stage P (Pre school)	Stage 1	Stage 2	Stage 3
<p>How many feet have these three teddy bears got altogether?</p>  <p>Strategy: begin to recognise repetitive addition of groups of the same size Recording: teacher demonstration of appropriate pictorial recording where appropriate. Vocabulary: groups, sets Equipment: every day objects, counters, fingers</p>	<p>How many wheels do we need for these three lego cars?</p>  $4 + 4 + 4 = 12$ <p>Strategy: begin to recognise repetitive addition of groups of the same size; counting in steps of 10 or 2 Recording: teacher demonstration of calculation to match pictorial recording using standard notation of + and =. Demonstrate on number line. Vocabulary: double, group, sets Equipment: every day objects, counters, fingers</p>	<p>Tina rolled double 6 on her two dice. What was her score?</p>   <p>Strategy: to recognise repetitive addition of groups of the same size; counting in steps of 2, 5 or 10 Recording: teacher demonstration of calculation to match pictorial recording using standard notation of + and =. Also use of tally. Demonstrate on number line. Vocabulary: double, group, Equipment: every day objects, counters, fingers, Multiplication facts ITP</p>	<p>What is the value of 6 two-pence coins?</p> $2p + 2p + 2p + 2p + 2p + 2p = 12p$ $6 \times 2p = 12p$  <p>Strategy: to recognise repetitive addition of groups of the same size; as an array; counting in steps of 2, 5 or 10 Recording: teacher demonstration of calculation to match pictorial recording (array) using standard notation of x and =. Demonstrate on number line. Vocabulary: double, groups of, times, multiply, multiple, lots of, Equipment: number lines, counters, array, 'Multiplication facts ITP'</p>
DIVISION			
Stage P (Pre school)	Stage 1	Stage 2	Stage 3
<p>If we share out these cakes so everyone has one each, how many will be left over? If everyone has two cakes, how many children will be able to have biscuits today?</p>  <p>Strategy: begin to recognise sharing equally; also repetitive addition or subtraction of groups of the same size Recording: teacher demonstration of appropriate pictorial recording where appropriate. Vocabulary: groups, share Equipment: every day objects, counters, fingers</p>	<p>Can we share out these cakes fairly? How shall we do it? If we put two cakes on each plate, how many plates do we need?</p>  <p>Strategy: begin to recognise sharing equally; also repetitive addition of 'groups' of the same size i.e. grouping Recording: teacher demonstration of calculation to match pictorial recording using standard notation of + and =. Demonstrate on number line. Vocabulary: groups, share, left over, half Equipment: every day objects, counters, fingers</p>	<p>Half the cakes in this box of 10 are gone. How many are left? Two cakes are put into each box. How many boxes do we need?</p>  $2 + 2 + 2 + 2 = 10$  <p>Strategy: begin to recognise sharing equally; also repetitive addition or subtraction of groups of the same size i.e. grouping Recording: teacher demonstration of calculation to match pictorial recording using standard notation of + and =. Demonstrate on number line. Vocabulary: groups, share, left over, half, each Equipment: every day objects, counters, fingers, Grouping ITP</p>	<p>How many sticks of 4 cubes can you make from a stick of 20 cubes? If 20 cubes are shared equally amongst 4 people, how many cubes do they each get?</p> <p>Pictorial recording as appropriate. Also:</p>  $4 + 4 + 4 + 4 = 20 \quad \text{or} \quad 4 \times 5 = 20$ $\text{or} \quad 20 \div 4 = 5 \text{ i.e. } 20 \text{ divided into groups of } 4. \text{ Then record as multiplication.}$ <p>X4</p>  <p>i.e. 5 groups of 4</p> <p>Strategy: recognise division as sharing equally; and, also repetitive addition or subtraction of groups of the same size i.e. grouping Recording: teacher demonstration of calculation to match pictorial recording using standard notation of + and =. Demonstrate on number line. Vocabulary: groups, share, left over, divide, divided by, equal groups of Equipment: number lines, counters, 'Grouping ITP'</p>

MULTIPLICATION AND DIVISION

MULTIPLICATION			
Stage 4	Stage 5	Stage 6	Stage 7
<p>There were 4 rows of eight chairs. How many chairs are there altogether?</p> <p>$8 + 8 + 8 + 8 = 32$ $8 \times 4 = 32$ Recognise that arrays can be arranged in any order.</p>  <p>Or record as multiplication.</p>  <p>Strategy: to recognise multiplication as repetitive addition of groups of the same size; as an array; as scaling. Counting in steps of 2, 3, 4, 5 or 10 Recording: Use of standard notation of x and =; number lines and arrays; introduce grid multiplication Vocabulary: double, groups of, times, multiply, multiple, lots of. Equipment: counters, array/square grid, number lines, multiplication grids, multiplication facts ITP</p>	<p>23 children went to the theatre. The cost of the coach and theatre ticket was £8 each. What was the total cost?</p> <p>$23 \times 8 = 8 \times 23$ Begin to use grid multiplication to compact the array</p>  <p>Strategy: to recognise multiplication as repetitive addition of groups of the same size; as an array; as scaling. Counting in steps of 2, 3, 4, 5 or 10 Recording: Use of standard notation of x and =; grid multiplication; number lines and arrays. Vocabulary: double, groups of, times, multiply, multiple, lots of, product, inverse Equipment: array/square grid, number lines, multiplication grids</p>	<p>The class wants to make 275 spiders for a display. How many legs do they need to make?</p> <p>$275 \times 8 = 8 \times 275$ Use grid multiplication as for Y4 then to compact the array:</p>  <p>Strategy: to recognise multiplication as repetitive addition of groups of the same size; as an array; as scaling. Counting in steps of any size to 10 and beyond Recording: Grid multiplication; use of standard notation of x and =; number lines and arrays. Vocabulary: double, groups of, times, multiply, multiple, lots of, product, inverse Equipment: array/square grid, number lines, multiplication grids</p>	<p>Calculate 509×24.</p> <p>Use grid multiplication to compact the array</p>  <p>Leading to standard long multiplication, when children are completely secure with above:</p>  <p>Strategy: to recognise multiplication as repetitive addition of groups of the same size; as an array; as scaling. Counting in steps of any size to 10 or 12 Recording: Grid multiplication; use of standard notation of x and =; number lines and arrays. Vocabulary: double, groups of, times, multiply, multiple, lots of, product, inverse Equipment: array/square grid, number lines, multiplication grids</p>

DIVISION			
Stage 4	Stage 5	Stage 6	Stage 7
<p>A class of 24 children were grouped in 3s. How many groups were there altogether? 24 children were divided equally between 3 rooms. How many children were in each room?</p> <p>$24 \div 3 = 8$ 24 divided into groups of 3</p>  <p>i.e. 24 divided into groups of 3 equals 8 groups of 3 or: 5 3</p> <p>i.e. $(5 \times 3) + (3 \times 3) = 24$ i.e. 24 divided into groups of 3 equals 8 groups of 3</p> <p>Strategy: recognise division as sharing equally; and, also repetitive addition or subtraction of groups of the same size i.e. grouping Recording: teacher demonstration of calculation to match pictorial recording using standard notation of + and =. Demonstrate on number line. Vocabulary: groups, share, left over, divide, divided by,</p>	<p>There are 87 shopping days to Christmas. How many weeks is that?</p> <p>$87 \div 7 = 12 \text{ r.}3$ 87 divided into groups of 7</p>  <p>Begin to record information vertically introducing repeated subtraction. Continue to use repeated addition if necessary. If children are secure, introduce vertical recording (using multiples which children are comfortable with)</p> <p>Strategy: recognise division as sharing equally; and, also repetitive addition or subtraction of groups of the same</p>	<p>Calculate $847 \div 7$.</p> <p>$848 \div 7 =$</p>  <p>Express remainders as quotients.</p> <p>Continue to use repeated addition if appropriate.</p> <p>Strategy: recognise division as sharing equally; and, also repetitive addition or subtraction of groups of the same size i.e. grouping Recording: teacher demonstration of calculation to match pictorial recording using standard notation of + and =. Demonstrate on number line. Vocabulary: groups, share, left over, divide, divided by,</p>	<p>87.5m of ribbon are cut into 7 equal lengths. How long is each length?</p> <p>$87.5 \div 7 =$</p>  <p>Express remainders as quotients. Use of formal written methods (including decimals)</p> <p>Strategy: recognise division as sharing equally; and, also repetitive addition or subtraction of groups of the same size i.e. grouping Recording: teacher demonstration of calculation to match pictorial recording using standard notation of + and =. Demonstrate on number line. Vocabulary: groups, share, left over, divide, divided by,</p>

<p>equal groups of, remainder Equipment: number lines, counters, 'Grouping ITP'</p>	<p>size i.e. grouping Recording: teacher demonstration of calculation to match pictorial recording using standard notation of + and =. Demonstrate on number line. Vocabulary: groups, share, left over, divide, divided by, equal groups of, remainder, divided into, divisible by, factor, quotient Equipment: number lines, counters, 'Grouping ITP'</p>	<p>equal groups of, remainder, divided into, divisible by, factor, quotient Equipment: number lines</p>	<p>equal groups of, remainder, divided into, divisible by, factor, quotient Equipment: number lines</p>
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Use of the calculator

Calculators are powerful tools. Like other tools, children need to learn to use them properly.

They are not an appropriate tool for calculations that can be done more quickly and reliably by mental or paper working. For this reason, calculators will not be used as a calculating aid until the later stages of KS2 after children have grasped some mental and written calculation strategies.

A quite different use of a calculator is as a resource for learning about a mathematical idea, just as a game or number line might be used.

Calculator use of this kind will usually be in KS2, although not exclusively in Year 5 & 6. Indeed, there may, however, be occasions in KS1 when a calculator is used to effectively assist the teaching of a particular topic or to a whole class.