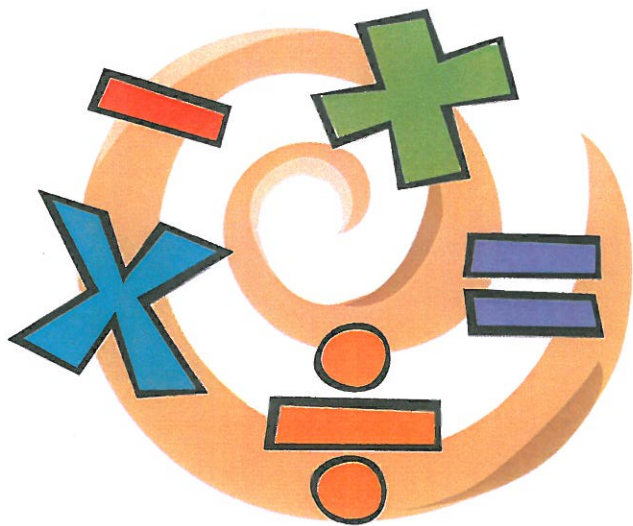




Crompton Buckstones Primary School



Calculation Policy

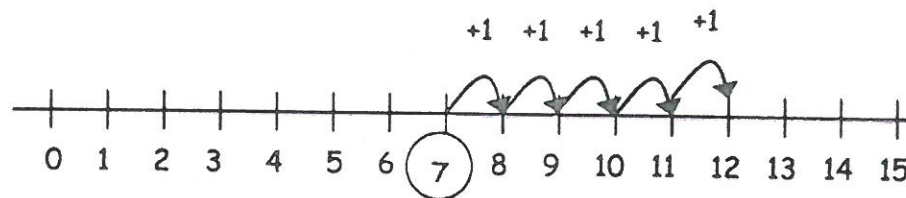
Crompton Buckstones Primary School - Written Calculations Policy

Addition		
Year Group	Steps	How the method should look
Reception	Using quantities and objects, they add 2 single-digit numbers and count on to find the answer	 +  $3 + 4 = 7$

identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least

NB. Not bridging tens beyond 30

$7 + 5 = 12$ Use of number lines to add single-digit numbers



Pictorial representations such as
 $10 + 3 = 13$



Use of hundred squares to add multiples of ten (eg. $23 + 10 = 33$), as well as 'near tens' such as $+ 9$ and $+ 11$

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
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

using concrete objects and pictorial representations, including those involving numbers, quantities and measures

Recording addition in columns supports place value and prepares for formal written methods with larger numbers.

Use a hundred square $56 + 23 = 79$

Add the tens by jumping down, add the ones by sliding across.

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
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

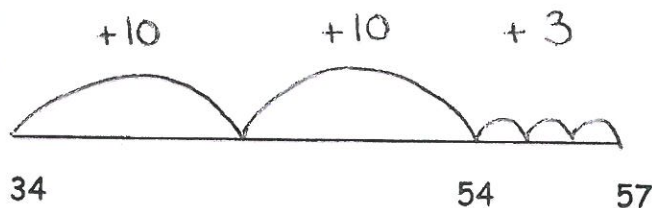
Use place value $34 + 23 = 57$

$$30 + 4$$

$$20 + 3$$

$$50 + 7 = 57$$

Use a landmark, then an unmarked numberline



Use column method

T	U
6	5
+ 3	3
9	8

Year 3	add numbers with up to three digits, using formal written methods of columnar addition and subtraction	<div data-bbox="712 209 1048 248" data-label="Equation-Block"> $235 + 342$ </div> <div data-bbox="1272 217 2011 284" data-label="Text"> <p>2 & 3 digit numbers not crossing 10s barrier</p> </div> <div data-bbox="678 308 1115 451" data-label="Equation-Block"> $\begin{array}{r} 200 + 30 + 5 \\ 300 + 40 + 2 \\ \hline 500 + 70 + 7 \end{array}$ </div> <div data-bbox="1261 320 1417 456" data-label="Equation-Block"> $\begin{array}{r} 24 \\ + 33 \\ \hline 57 \end{array}$ </div> <div data-bbox="1570 325 1776 461" data-label="Equation-Block"> $\begin{array}{r} 224 \\ + 533 \\ \hline 757 \end{array}$ </div> <div data-bbox="696 523 1249 584" data-label="Text"> <p>crossing 10s barrier (units only)</p> </div> <div data-bbox="1321 531 1986 592" data-label="Text"> <p>crossing 100s, 10s barrier (units + tens)</p> </div> <div data-bbox="772 622 956 775" data-label="Equation-Block"> $\begin{array}{r} 224 \\ + 537 \\ \hline 761 \end{array}$ </div> <div data-bbox="1456 632 1664 785" data-label="Equation-Block"> $\begin{array}{r} 284 \\ + 567 \\ \hline 851 \end{array}$ </div>
Year 4	add numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	<div data-bbox="736 952 943 1118" data-label="Equation-Block"> $\begin{array}{r} 678 \\ + 543 \\ \hline 1221 \end{array}$ </div> <div data-bbox="1178 956 1400 1125" data-label="Equation-Block"> $\begin{array}{r} 8492 \\ + 1321 \\ \hline 9813 \end{array}$ </div>

Year 5

add whole numbers with more than 4 digits, including using formal written methods (columnar addition)

$$\begin{array}{r} 4321 \\ + 5792 \\ \hline 10113 \\ \hline \end{array}$$

Year 6



add whole numbers with more than 4 digits, including using formal written methods (columnar addition)

$$\begin{array}{r} 42 \\ 6432 \\ 786 \\ 3 \\ + 4681 \\ \hline 11944 \\ \hline \end{array}$$

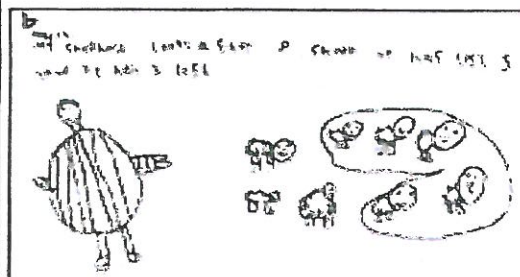
$$\begin{array}{r} 124.90 \\ + 7.25 \\ \hline 132.15 \\ \hline \end{array}$$

$$\begin{array}{r} 401.20 \\ 26.85 \\ + 0.71 \\ \hline 428.76 \\ \hline \end{array}$$

Crompton Buckstones Primary School - Written Calculations Policy

Subtraction		
Year Group	Steps	How the method should look
Reception	Using quantities and objects, they subtract 2 single-digit numbers and count back to find the answer	 -  $4 - 2 = 2$

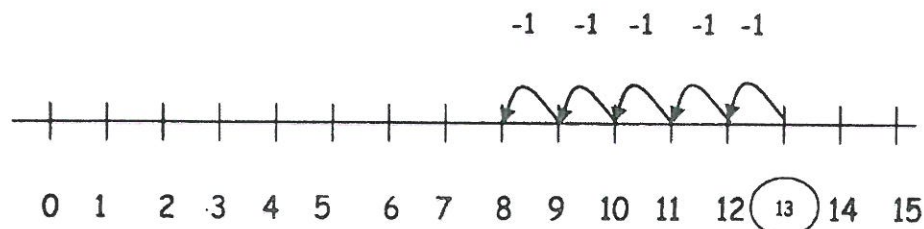
Pictorial representations such as



identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least

NB. Not bridging tens beyond 30

$13 - 5 = 9$ Use of number lines to subtract single-digit numbers



Use of hundred squares to subtract multiples of ten (eg. $33 - 10 = 23$), as well as 'near tens' such as -9 and -11

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
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

using concrete objects and pictorial representations, including those involving numbers, quantities and measures

Recording subtraction in columns supports place value and prepares for formal written methods with larger numbers.

Use a hundred square $68 - 23 = 45$

Subtract the tens by jumping up, subtract the ones by sliding across.

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
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

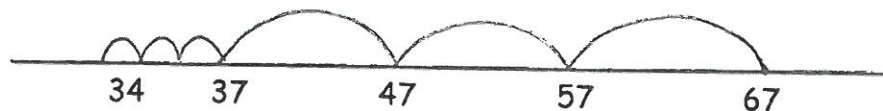
Use place value $74 - 23 = 51$

$$\begin{array}{r} 70 \quad 4 \\ - 20 \quad 3 \\ \hline 50 \quad 1 \end{array}$$

Subtract ten and multiples of ten e.g $76 - 20$ as 76, 66, 56 or in one hop $76 - 20 = 56$.

Use landmarked and unmarked numberlines.

Subtract two 2 digit numbers by counting back in tens the ones e.g $67 - 33$ as $67 - 30$ (37) then count back 3 (34)



Bridge ten e.g $52 - 6$, as 52 subtract 2 then 4 more.

Use column method

$$\begin{array}{r} \text{T} \quad \text{U} \\ 7 \quad 9 \\ - 3 \quad 3 \\ \hline 4 \quad 6 \end{array}$$

Year 3	<p>subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction</p>	$\begin{array}{r} 54 \\ - 23 \\ \hline 31 \end{array}$ $\begin{array}{r} 154 \\ - 23 \\ \hline 131 \end{array}$ $\begin{array}{r} 567 \\ - 314 \\ \hline 253 \end{array}$
Year 4	<p>subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate</p>	$\begin{array}{r} 5282 \\ - 323 \\ \hline 209 \end{array}$ $\begin{array}{r} 4821 \\ - 332 \\ \hline 189 \end{array}$ $\begin{array}{r} 4804 \\ - 312 \\ \hline 192 \end{array}$

Year 5	subtract whole numbers with more than 4 digits, including using formal written methods (columnar subtraction)	<div data-bbox="792 331 976 497"> $\begin{array}{r} \overset{8}{9} \overset{12}{7} \overset{1}{2} \\ - 457 \\ \hline 475 \end{array}$ </div> <div data-bbox="1137 331 1384 497"> $\begin{array}{r} \overset{4}{8} \overset{9}{0} \overset{6}{7} \\ - 2934 \\ \hline 2073 \end{array}$ </div>
Year 6	subtract whole numbers with more than 4 digits, including using formal written methods (columnar subtraction)	<div data-bbox="761 1008 999 1168"> $\begin{array}{r} \overset{5}{6} \overset{13}{4} \overset{6}{7} \\ - 2684 \\ \hline 3783 \end{array}$ </div> <div data-bbox="1093 1008 1406 1168"> $\begin{array}{r} 7 \overset{7}{8} \overset{11}{2} \overset{10}{1} \overset{6}{7} \overset{5}{5} \\ - 4387 \\ \hline 777788 \end{array}$ </div> <div data-bbox="1496 1008 1765 1168"> $\begin{array}{r} 3 \overset{1}{2} \overset{4}{4} \overset{8}{7} \overset{1}{0} \\ - 7.25 \\ \hline 317.65 \end{array}$ </div>

Crompton Buckstones Primary School - Written Calculations Policy

Multiplication		
Year Group	Steps	How the method should look
Reception	Solve problems, including doubling, halving and sharing	<div data-bbox="698 817 801 852" data-label="Image"> </div> <div data-bbox="869 793 1016 896" data-label="Image"> </div> <p>Share out the 4 apples between the 2 horses. How many do they each have?</p> <div data-bbox="663 1003 842 1139" data-label="Image"> </div> <div data-bbox="860 1046 972 1139" data-label="Image"> </div> <p>2 apples each</p>

Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

Through grouping and sharing small quantities, pupils begin to understand: multiplication and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities.

They make connections between arrays, number patterns, and counting in twos, fives and tens.

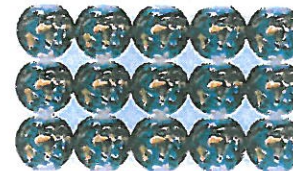
Counting in 2s, 5s, 10s lots of work done orally before any recording.

NB. No use of \times symbol in Year 1; instead, use 'lots of' and 'groups of'. Use also pictorial representations:

eg. 4 lots of 2



3 groups of 5

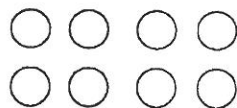


solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

Understand multiplication as

- **repeated addition:** for example
5 added together 3 times is $5 + 5 + 5$, or 3 lots of 5, or 3 times 5, or 5×3 (or 3×5)
- **Describing an array** e.g

$$4 \times 2 = 8$$



$$2 \times 4 = 8$$

Use arrays to find the answers to multiplication.

Know that 3×4 can be interpreted as 3 lots of four things and that 6×5 is six steps in the 5 times table, as well as 6 lots of 5.

Understand that 5×3 can be worked out as 3 5's or 5 3's.

Year 3

Pupils develop reliable written methods for multiplication, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short multiplication.

$$23 \times 5$$

$$3 \times 5 = 15$$

$$20 \times 5 = 100$$

$$100 + 15 = 115$$

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \end{array}$$





Year 4

Multiply two-digit and three-digit numbers by a one-digit number using formal written layout
Pupils practise to become fluent in the formal written method of short multiplication and short division with exact answers (see Mathematics Appendix 1).

$$\begin{array}{r} 342 \\ \times 7 \\ \hline 2394 \end{array}$$

Year 5	<p>Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers</p> <p>Extend to simple decimals with one decimal place</p>	$ \begin{array}{r} 124 \\ \times 26 \\ \hline 744 \\ 2480 \\ \hline 3224 \end{array} $ $ \begin{array}{r} 4.9 \\ \times 3 \\ \hline 14.7 \end{array} $
Year 6	<p>Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication</p> <p>Extend to decimals with up to two decimal places</p>	$ \begin{array}{r} 352 \\ \times 27 \\ \hline 2464 \\ 7040 \\ \hline 9504 \end{array} $ $ \begin{array}{r} 4.92 \\ \times 3 \\ \hline 14.76 \end{array} $

Crompton Buckstones Primary School - Written Calculations Policy

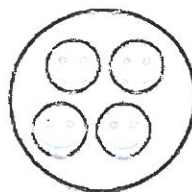
Division		
Year Group	Steps	How the method should look
Reception	Solve problems, including doubling, halving and sharing.	<div></div> <p>Share out the 4 apples between the 2 horses. How many do they each have?</p> <div> 2 apples each</div>

Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

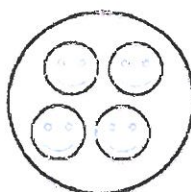
Through grouping and sharing small quantities, pupils begin to understand: multiplication and division; doubling numbers and quantities; and finding simple fractions* of objects, numbers and quantities.

* halves and quarters

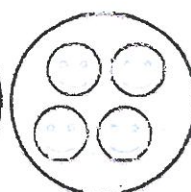
Bob



Jim



Tom



12 shared between 3 is



Use pictorial representations and make real-life links to support concept of sharing.

recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers

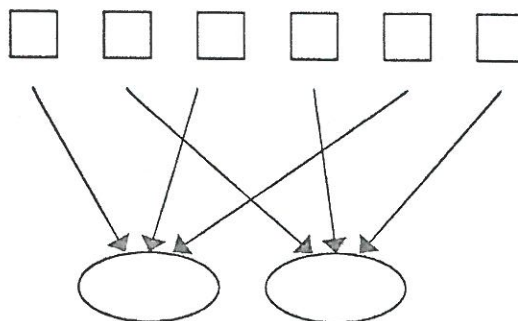
calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs

show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot

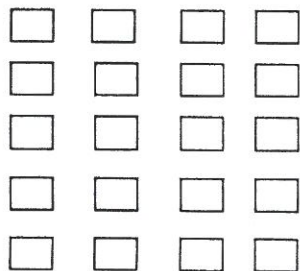
solve problems involving division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

Understand the operation of division as:

sharing equally: for example, 6 sweets are shared equally between 2 people. How many sweets does each one get?



grouping: relate division to multiplication by arrays or towers of cubes to find answers to division e.g. how many towers of five cubes can I make from 20 cubes as $\square \times 5 = 20$ and $20 \div 5 = \square$



Using a number line for repeated subtraction:

$$12 \div 3 = 4$$



Year 3	<p>Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables</p> <p>Pupils develop reliable written methods for division, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short multiplication and division.</p>	$\begin{array}{r} 22 \\ 4 \overline{) 88} \end{array}$ $\begin{array}{r} 12 \text{ r } 1 \\ 4 \overline{) 49} \end{array}$ $\begin{array}{r} 16 \text{ r } 3 \\ 4 \overline{) 67} \end{array}$
Year 4	<p>Recall multiplication and division facts for multiplication tables up to 12×12</p> <p>Pupils practise to become fluent in the formal written method of short division with exact answers (see <u>Mathematics Appendix 1</u>).</p>	$\begin{array}{r} 14 \\ 7 \overline{) 98} \end{array}$ $\begin{array}{r} 022 \text{ r } 2 \\ 6 \overline{) 134} \end{array}$

Year 5

Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context.
Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.

$$\begin{array}{r} 86 \text{ r } 2 \\ 5 \overline{) 432} \end{array}$$

Th	H	T	U	$\frac{1}{10}$	$\frac{1}{100}$
	3	1	7		
		3	1	7	

$$317 \div 10 = 31.7$$

Year 6

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
Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context.

$$\begin{array}{r} 28 \text{ r } 12 \\ 15 \overline{) 432} \\ \underline{-300} \\ 132 \\ \underline{-120} \\ 12 \end{array} \quad \begin{array}{l} 15 \times 20 \\ 15 \times 8 \end{array}$$

$$\begin{array}{r} 28.8 \\ 15 \overline{) 432.0} \\ \underline{30} \downarrow \\ 132 \\ \underline{120} \downarrow \\ 120 \\ \underline{120} \\ 0 \end{array}$$

Ans: $28 \text{ r } 12$ or $28 \frac{12}{15} \frac{4}{5}$ or 28.8

$$\begin{array}{r} 86.4 \\ 5 \overline{) 432.0} \end{array}$$