



Uffculme Primary School Calculation Policy

February 2015



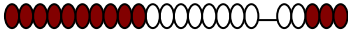
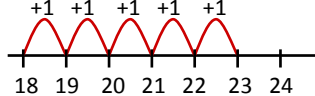
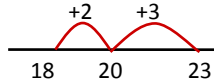
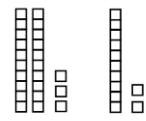
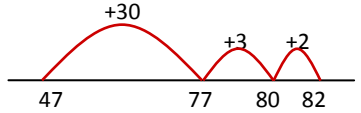
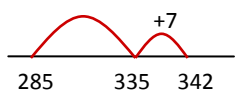


Introduction

This calculation policy shows the progression of the four maths operations (addition, subtraction, multiplication and division) used across Uffculme Primary School. It details different methods for each year group. Class teachers will teach the most suitable methods, based on their assessment of the children in their class. Children are taught a range of methods and are encouraged to choose the most efficient method for the calculation concerned. Children may be taught different methods from other year groups, depending on their needs. If you have any queries, please contact your child's class teacher.



Addition



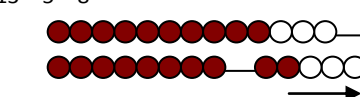
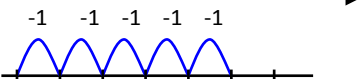
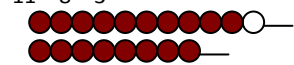
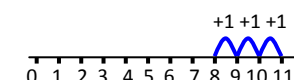
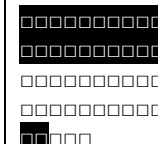
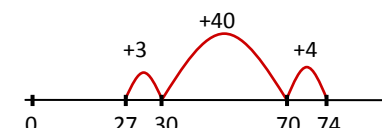
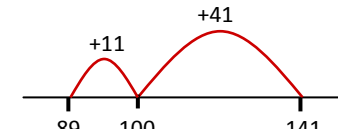
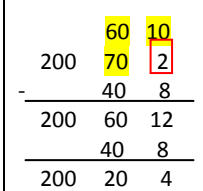
	New age-related expectations	Recording				Rapid Recall	Mental Arithmetic	
YR	Addition as 'combining 2 groups'	Practical recorded using ICT (eg digital photos / pictures on IWB)	Pictures / Objects/Number track I buy 2 cakes and my friend buys 3 cakes. How many cakes did we buy altogether?  [Might be recorded as: 2 + 3 = 5]	Symbols 8 people are on the bus. 5 more get on at the next stop. How many people are on the bus now?  [Might be recorded as: 8 + 5 = 13]		1 more (up to 20) Counting up to 20	(see recording)	
Y1	Addition as 'counting on' $\square + \square$ (bridging 10) $\square\square + \square$ (bridging 20)	Practical recorded using ICT	Pictures / Symbols (see above)	Number line jumps of 1 (modelled using bead strings) $18 + 5 = 23$  	Number line (efficient jumps) $18 + 5$ 	No number line $18 + 5$ $18 + 2 = 20$ $20 + 3 = 23$	Pairs to 20 Facts up to 20 1 / 10 more than a number Derive relate facts	$\square +$ multiple of 10 $\square\square +$ multiple of 10 $+9$ (by +10, -1)
Y2	$\square\square + \square\square$ (bridging 10s)	Pictures / Symbols  $23 + 12 = 35$	Number line (efficient jumps) $35 + 47$  (can also make jumps of 10s and 1s)	No number line $35 + 47$ $47 + 30 = 77$ $77 + 3 = 80$ $80 + 2 = 82$	Partitioning and recombining $35 + 47$ $40 + 30 = 70$ $7 + 5 = 12$ $70 + 12 = 82$	Bonds up to 20 Pairs to 100	$\square\square + \square$ / multiple of 10 $\square + \square + \square$	
Y3	$\square\square + \square\square$ (bridging 100) $\square\square\square + \square\square$ (not bridging 1000) $\square\square\square + \square\square\square$ (not bridging 1000)	Number line $57 + 285 = 342$ 	No number line $57 + 285$ $285 + 50 = 335$ $335 + 7 = 342$	Partitioning $57 + 285$ $200 + 0 = 200$ $80 + 50 = 130$ $5 + 7 = 12$	Expanded vertical $336 + 87 = 423$ 300 and 30 and 6 $+ 80$ and 7 300 and 110 and 13	Expanded vertical 336 $+ 87$ 13 (6+7) 110 (30+80) 300 (300+0) 423	Bonds to 20 / 100 Pairs of two-digit multiples of 10 Multiples of 50 that total 1000	$\square\square\square + \square$ / $\square\square$ $\square\square +$ near multiple of 10



<p>Y4</p>	<p>□□□ + □□ □□□ + □□□ (incl bridging 1000)</p> <p>Decimals: money (£7.85 + £3.49)</p>	<p>No number line (Go back a stage if needed)</p> <p>374 + 248</p> <p>374 + 200 = 574 574 + 40 = 614 614 + 8 = 622</p>	<p>Partitioning</p> <p>374 + 248</p> <p>300 + 200 = 500 70 + 40 = 110 4 + 8 = 12</p>	<p>Expanded vertical</p> $\begin{array}{r} 374 \\ + 248 \\ \hline 12 \text{ (4 + 8)} \\ 110 \text{ (70 + 40)} \\ \hline 500 \text{ (300 + 200)} \\ \hline 622 \end{array}$	<p>Compact vertical</p> $\begin{array}{r} 374 \\ + 248 \\ \hline 622 \\ \hline \end{array}$	<p>Bonds to 1000</p> <p>Derive sums of pairs of multiples of 10 / 100 / 1000</p> <p>Multiples of 50 that total 1000</p> <p>Pairs of fractions to 1</p>	<p>□□□□ + □□□□ (Pairs of multiples of 10 / 100 / 1000)</p> <p>Three, 2-digit multiples of 10</p> <p>Two, three-digit multiples of 10</p>
<p>Y5</p>	<p>□□□□ + □□□□ Decimals up to 2dp (23.7 + 48.56)</p>	<p>No number line (Go back a stage if needed)</p>	<p>Expanded vertical</p> $\begin{array}{r} 23.70 \\ + 48.56 \\ \hline 0.06 \text{ (0 + 0.06)} \\ 1.20 \text{ (0.7 + 0.5)} \\ 11.00 \text{ (3 + 8)} \\ \hline 60.00 \text{ (20 + 40)} \\ \hline 72.26 \end{array}$	<p>Compact vertical</p> $\begin{array}{r} 23.70 \\ + 48.56 \\ \hline 72.26 \\ \hline \end{array}$	<p>Bonds up to 1 (2dp)</p> <p>Bonds up to 10 (1dp)</p>	<p>□.□ + □.□</p>	
<p>Y6</p>	<p><i>Consolidate / extend Y5 including:</i></p> <p>Three numbers Decimals up to 3dp (context: measures)</p>	<p>No number line (Go back a stage if needed)</p>	<p>Compact vertical</p> $\begin{array}{r} 3.243 \\ + 18.070 \\ \hline 21.313 \\ \hline \end{array}$		<p>(as above)</p>	<p>(as above)</p>	



Subtraction



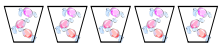
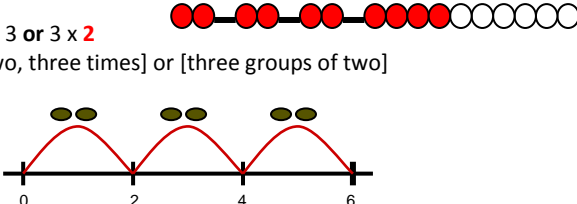
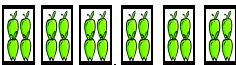

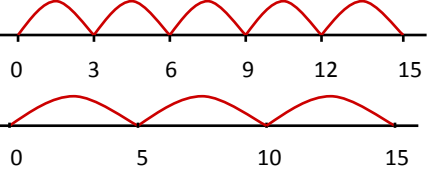
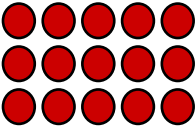
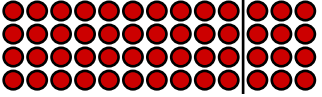

	New age-related expectations	Recording			Rapid Recall	Mental Arithmetic	
YR	Subtraction as 'taking away' from a group	Practical or recorded using ICT (e.g digital photos / pictures on IWB)	Pictures / Objects I have five cakes. I eat two of them. How many do I have left?  Might be recorded as: $5 - 2 = 3$	Symbols Mum baked 9 biscuits. I ate 5. How many were left? 	1 less (nos up to 20)	(see recording)	
Y1	Subtraction as 'taking away' and 'difference' (by counting on) $\square - \square$ $\square\square - \square$ (bridging 10)	Practical or recorded using ICT Pictures / Symbols (see above)	Taking away – jumps of 1 (modelled using bead strings) $13 - 5 = 8$  	Counting on – jumps of 1 (modelled using bead strings) $11 - 8 = 3$  	Counting on (efficient jumps) Number line / no number line $8 + 2 = 10$ $10 + 1 = 11$	Subtraction facts to 10 1 / 10 less than a number	$\square\square - \square$ – multiple of 10
Y2	Subtraction as inverse of addition $\square\square - \square\square$ (bridging 10s)	Pictures / Symbols $45 - 22 = 23$ 	Number line – counting on $74 - 27 = 47$  (Can also jump in 10s and 1s)	Partitioning $74 - 27$ $74 - 20 = 54$ $54 - 4 = 50$ $50 - 3 = 47$	Subtraction facts to at least 10	Difference by counting up $\square\square - \square$ / multiple of 10	
Y3	 $\square\square - \square\square$ $\square\square\square - \square\square$ $\square\square\square - \square\square\square$	Number line – counting on for small differences $141 - 89 = 52$ 	Partitioning $272 - 48$ $272 - 40 = 232$ $232 - 8 = 224$	Decomposition $272 - 48 = 224$  Exchange a ten for ten ones	Subtraction facts to 20 Differences of multiples of 10	$\square\square - \square / \square\square$ $\square\square\square - \square\square\square$ (by finding the difference) $\square\square - \square$ – near multiple of 10 (positive answers)	



<p>Y4</p>	<p>□□□ - □□ □□□ - □□□</p> <p>Decimals: money (£7.85 - £3.49)</p>	<p>Decomposition</p> <p>723 - 458 = 265</p> <p>700 20 3</p> $\begin{array}{r} 400 \ 50 \ 8 \\ 600 \ 110 \ 13 \\ \hline 400 \ 50 \ 8 \\ \hline 200 \ 60 \ 5 \end{array}$	<p>Decomposition (compact method)</p> $\begin{array}{r} 6 \ 13 \ 11 \\ 7 \ 4 \ 1 \\ - 3 \ 6 \ 7 \\ \hline 3 \ 7 \ 4 \end{array}$	<p>Derive differences of pairs of multiples of 10 / 100 / 1000</p>	<p>□□□□ - □□□□</p> <p>Subtract pairs of multiples of 10 / 100 / 1000</p> <p>□□□□ - □□□□ (small difference)</p>
<p>Y5</p>	<p>□□□□ - □□□□</p> <p>Decimals up to 2dp (72.5 - 45.7)</p>	<p>Decomposition (compact method)</p> <p>4598 - 1729</p> $\begin{array}{r} 3 \ 4 \ 1 \ 5 \ 8 \ 9 \ 1 \ 8 \\ \hline 1 \ 7 \ 2 \ 9 \\ \hline 2 \ 8 \ 6 \ 9 \end{array}$ <p>72.5 - 45.7</p> $\begin{array}{r} 6 \ 7 \ 1 \ 2 \ 1 \ 5 \\ - \ 4 \ 5 \ 7 \\ \hline 2 \ 6 \ 8 \end{array}$	<p>Use number facts for mental subtraction</p> <p>9 - 2 = 7</p> <p>0.9 - 0.2 = 0.7</p> <p>0.09 - 0.02 = 0.07</p>	<p>Near multiple of 1000 - Near multiple of 1000 (eg 6070 - 4097)</p> <p>□.□ - □.□</p>	<p>Near multiple of 1000 - Near multiple of 1000 (eg 6070 - 4097)</p> <p>□.□ - □.□</p>
<p>Y6</p>	<p><i>Consolidate / extend Y5 including:</i></p> <p>Decimal to 3 dp relating to measures</p>	<p>Recognise when one written method is more efficient</p> <ul style="list-style-type: none"> There was 2.5 litres in the jug. Stuart drank 385 ml. How much was left? 18.07 km - 3.243 km 	<p>(as above)</p>	<p>(as above)</p>	<p>(as above)</p>



Multiplication

	New age-related expectations	Recording		Rapid Recall	Mental Arithmetic	
YR	Solve practical problems involving doubling	Practical / recorded using ICT (e.g. digital photos / pictures on IWB)	Pictures / Objects 3 plates, 2 cakes on each plate: 	Symbols 3 plates, 2 cakes on each plate: 	Counting on in 1s and 2s	(see recording)
Y1	Solve (practical) problems	Practical / recorded using ICT	Pictures / Symbols There are three sweets in one bag. How many sweets are there in five bags? 	Number line (modelled using bead strings) 2×3 or 3×2 [two, three times] or [three groups of two] 	Count on in 1s, 2s, 5s and 10s Doubles of numbers to 20	(see recording)
Y2	Multiplication as repeated addition and arrays	Pictures / Symbols There are four apples in each box. How many apples in six boxes?  	Repeated addition 5×3 or 3×5 	Arrays 5×3 or 3×5  Also 14×2 as (10 x 2 and 4 x 2)	Count in 2s, 5s and 10s Derive multiples of 2, 5 & 10 Relate to x facts (and derive related ÷ facts) Doubles of numbers to 100	Doubles of □□ numbers
Y3	□□x□ (e.g. 13 x 4)	Arrays 13×4  $10 \times 4 = 40$ $3 \times 4 = 12$	Compact grid method 13×4 	Partitioning (possible use of number line to record steps) $13 \times 4 = 52$ $10 \times 4 = 40$ $3 \times 4 = 12$	Derive / recall 2, 3, 4, 5, 6, 8 and 10 times tables (Derive related division facts) Recognise multiples of 2, 5 and 10 up to 1000	$\square/\square \times 10 / 100$ (describe the effect) Doubles of □□ / □□□ numbers



<p>Y4</p>	<p>Record, support and explain: □□x□ □□□x□</p>	<p>Partitioning</p> <p>43 x 6 (estimate: 40 x 6 = 240)</p> <p>40 x 6 = 240 3 x 6 = 18</p>	<p>Compact grid method</p> <p>43 x 6</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>x</td> <td>40</td> <td>3</td> </tr> <tr> <td>6</td> <td style="background-color: #00ff00;">240</td> <td style="background-color: #0000ff;">18</td> </tr> </table>	x	40	3	6	240	18	<p>Expanded vertical</p> $\begin{array}{r} 43 \\ \times 6 \\ \hline 18 \quad (3 \times 6) \\ \underline{240} \quad (40 \times 6) \\ 258 \end{array}$	<p>Compact vertical</p> $\begin{array}{r} 43 \\ \times 6 \\ \hline 258 \\ 1 \end{array}$	<p>Derive / recall facts to 10 x 10</p> <p>Multiples of numbers to 10 up to the 10th multiple</p>	<p>Numbers up to 1000 x 10 / 100 (whole number answers and understand the effect)</p> <p>Doubles of □□ / □□□ numbers and multiples of 10 / 100</p>									
x	40	3																				
6	240	18																				
<p>Y5</p>	<p>Refine and use efficient methods: □□□ x □ □□ x □□ □.□ x □</p>	<p>Grid method</p> <p>47 x 36 (estimate: 50 x 40 = 2000)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>x</td> <td>40</td> <td>7</td> <td></td> </tr> <tr> <td>30</td> <td>1200</td> <td>210</td> <td>1410</td> </tr> <tr> <td>6</td> <td>240</td> <td>42</td> <td>282</td> </tr> <tr> <td></td> <td></td> <td></td> <td>1692</td> </tr> </table>	x	40	7		30	1200	210	1410	6	240	42	282				1692	<p>Expanded vertical</p> <p>237 x 4 (estimate 250 x 4 = 1000)</p> $\begin{array}{r} 237 \\ \times 4 \\ \hline 28 \quad (7 \times 4) \\ 120 \quad (30 \times 4) \\ \underline{800} \quad (200 \times 4) \\ 948 \end{array}$	<p>Compact vertical</p> <p>256 x 18 (estimate: 250 x 20 = 5000)</p> $\begin{array}{r} 256 \\ \times 18 \\ \hline 2048 \\ \underline{2560} \\ 4608 \\ 1 \end{array}$ <p>Answer: 256 x 18 = 4608</p>	<p>Recall quickly facts to 12 x 12 Use facts to multiply pairs of multiples of 10 / 100</p> <p>Use known facts to derive other facts [Find common multiples of two numbers]</p>	<p>□□ x □ (eg 12 x 9) □□ x □□ (eg 16 x 25)</p> <p>Doubles of □.□ / .□</p> <p>Multiply whole numbers / decimals by 10 / 100 / 1000</p>
x	40	7																				
30	1200	210	1410																			
6	240	42	282																			
			1692																			
<p>Y6</p>	<p>Use efficient methods: □□□□ x □ (e.g. 2307 x 8) □□.□ x □ (eg 31.6 x 7) □□ x □□ □□□ x □□</p>	<p>Grid method</p> <p>5.65 x 9 (estimate: 6 x 9 = 54)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>x</td> <td>5</td> <td>0.6</td> <td>0.05</td> <td></td> </tr> <tr> <td>9</td> <td>45</td> <td>5.4</td> <td>0.45</td> <td>50.85</td> </tr> </table> <p>Answer: 5.65 x 9 = 50.85</p>	x	5	0.6	0.05		9	45	5.4	0.45	50.85	<p>Expanded vertical</p> <p>2327 x 8 (estimate: 2300 x 10 = 23,000)</p> $\begin{array}{r} 2327 \\ \times 8 \\ \hline 56 \quad (7 \times 8) \\ 160 \quad (20 \times 8) \\ 2400 \quad (300 \times 8) \\ \underline{16000} \quad (2000 \times 8) \\ 18616 \end{array}$	<p>Compact vertical</p> <p>4.7 x 8 (estimate: 5 x 8 = 40)</p> $\begin{array}{r} 4.7 \\ \times 8 \\ \hline 37.6 \\ 5 \end{array}$	<p>Use facts up to 10 x 10 to derive facts involving multiples of 10 / 100 (eg 80 x 30) and decimals (eg 0.8 x 7)</p> <p>Derive squares of numbers to 12 x 12 Derive corresponding squares of multiples of 10</p>	<p>TU x U U.t x U</p> <p>Integer x 1000 / 100 / 10 / 0.1 / 0.01</p>						
x	5	0.6	0.05																			
9	45	5.4	0.45	50.85																		



Division

	New age-related expectations	Recording		Rapid Recall	Mental Arithmetic	
YR	Share objects into equal groups and count how many in each group	Practical / recorded using ICT (e.g. digital photos / pictures on IWB)	<p>Pictures / Objects</p> <p>6 cakes shared between 2</p> <p>6 cakes put into groups of 2</p>	<p>Symbols</p> <p>6 cakes shared between 2</p> <p>6 cakes put into groups of 2</p>		(see recording)
Y1	Solve (practical) problems that involve sharing into equal groups	Practical / recorded using ICT	<p>Pictures / Symbols</p> <p>How many apples in each bowl if I share 12 apples between 3 bowls?</p>	<p>Number tracks / Number line (modelled using bead strings)</p> <p>$8 \div 2 = 4$</p> <p>$6 \div 2 = 3$</p>		(see recording)
Y2	Division as sharing and grouping (including remainders)	<p>Pictures / Symbols</p> <p>Four eggs fit in a box. How many boxes would you need to pack 20 eggs?</p>	<p>Number lines / Arrays</p> <p>$15 \div 5$</p>	<p>Partitioning</p> <p>$28 \div 2$</p> <p>$20 \div 2 = 10$</p> <p>$8 \div 2 = 4$</p>	<p>Derive / recall \div facts for 2, 5 and 10 tables</p> <p>$\square \square \div 2$</p> <p>Derive / recall halves of even numbers to 40</p>	$\square \square \div 2$
Y3	Round remainders up / down, depending on the context	<p>Number lines (start from zero)</p> <p>$33 \div 5 = 6 \text{ r}3$</p>	<p>Partitioning (multiples of the divisor)</p> <p>$50 \div 4 = 12 \text{ r}2$</p> <p>$10 \times 4 = 40$</p> <p>$2 \times 4 = 8 \quad (48)$</p>	<p>Derive / recall \div facts for 2, 3, 4, 5, 6, 8 and 10 tables</p>	$\square \square / \square \square \div 2$	



<p>Y4</p>	<p>Record, support and explain: □□ ÷ □ (e.g. 98 ÷ 6)</p>	<p>Partitioning (multiples of the divisor) 67 ÷ 4 = 16 r3 10 x 4 = 40 6 x 4 = 24 (64)</p>	<p>Grouping (vertical layout) 96 ÷ 7 96 -70 (7×10) 26 -21 (7×3) 5 Answer: 13 R 5</p>	<p>Grouping (expanded) 6)196 -60 6×10 136 -60 6×10 76 -60 6×10 16 -12 6×2 4 32 Answer: 32R4</p>	<p>Short division 291 ÷ 3 (estimate: 270 ÷ 3 = 90) 3)290+1=3)270+21 90+7 This is then shortened to: 3)297 97 3)297</p>	<p>Derive / recall ÷ facts up to the 12 times table</p>	<p>Numbers up to 1000 ÷ 10 / 100 (whole number answers and understand the effect) Halves of □□ / □□□ numbers and multiples of 10 / 100</p>
<p>Y5</p>	<p>Refine and use efficient methods: □□□ ÷ □ □□□□ ÷ □</p>	<p>Grouping (efficient) 346 ÷ 8 (estimate: 400 ÷ 8 = 50) 8)346 -320 (8×40) 26 -24 (8×3) 2 Answer: 43 R 2</p>	<p>Partitioning 247 ÷ 7 = 35 r2 30 x 7 = 210 5 x 7 = 35 (245)</p>	<p>Short division 291 ÷ 3 (estimate: 270 ÷ 3 = 90) 3)290+1=3)270+21 90+7 This is then shortened to: 3)297 97 3)297</p>	<p>Recall quickly ÷ facts up to 10 times table</p>	<p>Divide using factors of the divisor (eg ÷8 by ÷2 and then ÷4) Divide numbers by 10 / 100 / 1000 (describe the effect) Halves of □.□</p>	
<p>Y6</p>	<p>Use efficient methods: □□□□ ÷ □ Decimal ÷ □ (e.g. 27.6 ÷ 8) □□□ ÷ □□</p>	<p>Grouping (efficient) 25.6 ÷ 8 (estimate: 24 ÷ 8 = 3) 8)25.6 -24.0 (8×3.0) 1.6 -1.6 (8×0.2) 0 Answer: 25.6 ÷ 8 = 3.2</p>	<p>Short division 43.4 ÷ 7 (estimate: 42 ÷ 7 = 6) 7)43.4 6.2 14 14 0</p>	<p>Partitioning 43.4 ÷ 7 = 6.2 6 x 7 = 42 0.2 x 7 = 1.4 (43.4)</p>	<p>Long division 560 ÷ 24 (estimate: 550 ÷ 25 = 22) 24)560 -480 80 -72 8 Answer: 23 R 8</p>	<p>Derive ÷ facts involving multiples of 10 / 100 (e.g. 240 ÷ 30) and decimals (e.g. 4.8 ÷ 6)</p>	<p>Divide using factors of the divisor (eg ÷15 by ÷5 and then ÷3) □□ ÷ □ □.□ ÷ □□ Integer ÷ 1000 / 100 / 10</p>