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# GREAT CHART PRIMARY SCHOOL

## CALCULATION POLICY

September 2023



The Progression of Skills for addition, subtraction, multiplication and division are set out on the following pages.


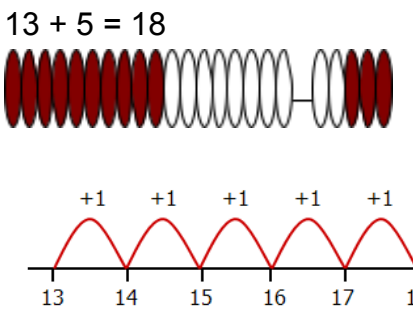
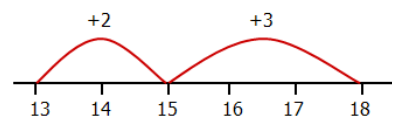
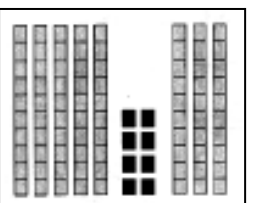
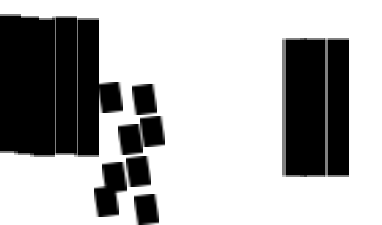
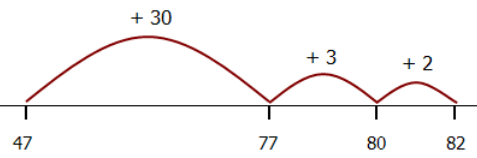
Our Philosophy for teaching and learning is through our

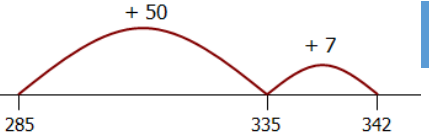

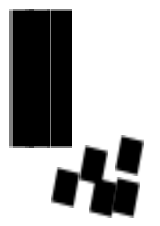
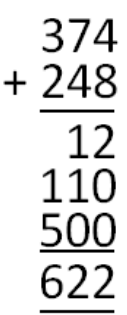
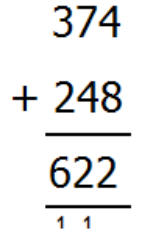
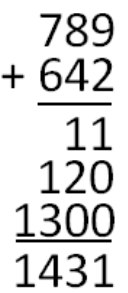
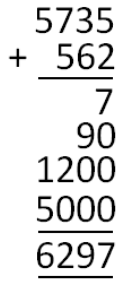
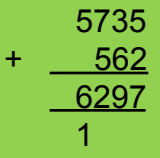
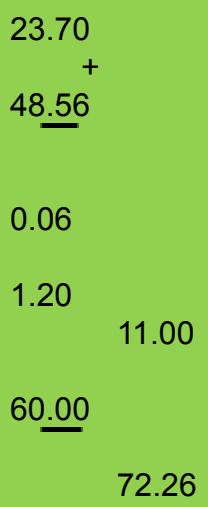
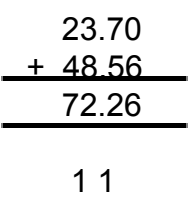
**‘Make it! Draw it! Write it!’** approach (CPA).

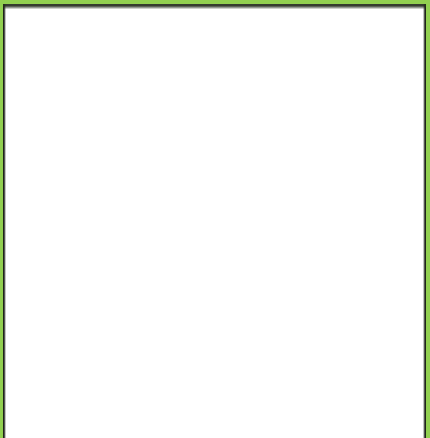
At the end of the ‘Draw it’ stage, teachers demonstrate, and children rehearse, how the ‘bar model’ supports problem solving and reasoning. See Appendix 1 for exemplification in the progression of the bar model ([hertsforlearning.co.uk](http://hertsforlearning.co.uk)).

Within all stages of the progression of skills, children are exposed to procedural and conceptual variation, developing their mathematical approaches and mastery skills. See Appendix 2 for exemplification on Procedural and Conceptual Variation (*NCETM Maths Hubs, Cambridge*).



<b>Addition</b>	Progression of Skills 	Manipulatives/Concrete Objects	Vocabulary
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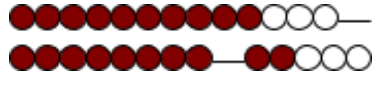
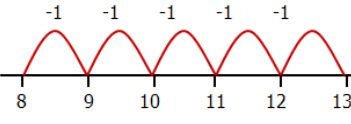

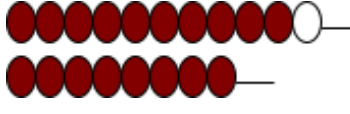
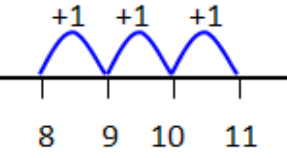
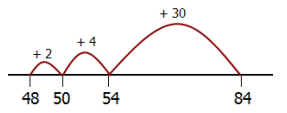
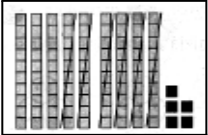
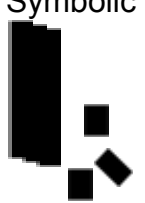
Initial Stages	<p>Pupils use concrete objects and pictorial representations</p>	<p>Practical/recorded using ICT.</p> <p>Hannah ... listed how many girls and how many boys were outside. [She] was able to say that "There are 5 girls and 4 boys. That's 9 altogether".</p> <p>When playing in the shop Christopher used his shopping list to add 2 amounts. He said "the beans are 5 pence and the bananas are 3 pence, altogether that is 8 pence."  <a href="#">[EYFS Profile exemplifications. STA]</a></p>	<p>Pictures/Objects</p> <p>I eat 2 cakes and my friend eats 3. How many cakes did we eat altogether? Language rich.</p>	<p>Symbolic</p> <p>8 people are on the bus. 5 more get on at the next stop. How many people are on the bus now</p>  <p>s</p> <p><b>[Might be recorded as: 8 + 5 = 13]</b></p>	<p>Numerical</p> <p>Cubes Concrete objects (compare bears etc) Teacher beadstring/bar</p>	<p>add, more, and make, sum, total</p> <p>score double one more, two more, ten more... how many more to make...? how many more is... than...?</p>	
Stage One	<p>Pupils use concrete objects and pictorial representations</p>	<p>Practical/recorded using ICT Pictures/Symbolic (see above)</p>	<p>Use known facts/partitioning</p> <p>Visual (modelled using bead strings)</p> <p>8 + 5 = 13</p> <p>8 + 2 = 10</p> <p>10 + 3 = 13</p>  <p>Using drywipe numberlines</p>	<p>Visual (efficient jumps)</p> <p>13 + 5 = 18</p>  <p>[jumps may be in 1s] Using drywipe numberlines</p>	<p>Numicon T and U Numicon sets Numicon number lines etc Straws Cubes Concrete objects (compare bears etc) Beadstrings Numberlines (drywipe) Multilink/counters</p>	<p>+, add, more, plus make, sum, total altogether score double, near double one more, two more... ten more how many more to make...? how many more is... than...? how much more is...?</p>	
Stage Two	<p>Recognise/use inverse relationship between +/- and use to check calcs and missing number problems.</p> <p>Pupils use concrete objects, pictorial representations and mental strategies.</p>	<p>Practical/visual images 58 + 30 = 88</p>  <p>Draw rods and dots</p> 	 <p>Visual (efficient jumps)</p> <p>35 + 47 = 82</p> <p><b>[Also jumps can be in 10s and 1s]</b> Using empty numberlines – progress from drywipe to drawing their own</p>	<p>No number line</p> <p>35 + 47 = 82</p> <p>47 + 30 = 77</p> <p>77 + 3 = 80</p> <p>80 + 2 = 82</p> <p>Linear recording</p>	<p>Partitioning</p> <p>35 + 47 = 82</p> <p>40 + 30 = 70</p> <p>7 + 5 = 12</p> <p>Linear recording</p> <p>Partitioning could be extended to recording addition in columns which supports place value and prepares for formal written methods with larger numbers. (Higher ability children).</p> <p>47 + 35 = 82</p> $\begin{array}{r} 40 + 7 \\ 30 + 5 \\ \hline 70 + 12 \end{array}$	<p>Numicon Straws Cubes Empty numberlines Dienes</p>	<p>ADDITION AND SUBTRACTION +, add, addition, more, plus make, sum, total altogether score double, near double one more, two more... ten more... one hundred more how many more to make...? how many more is... than...? how much more is...?</p>

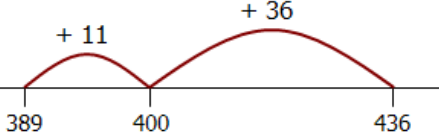

<b>S</b> <b>t</b> <b>a</b> <b>g</b> <b>e</b> <b>T</b> <b>h</b> <b>r</b> <b>e</b>	<p>No number</p> <p>line/partitioning</p> <p><math>57 + 285 = 342</math></p> <p><math>285 + 50 = 335</math></p> <p><math>335 + 7 = 342</math></p>	<p>Number line <math>57 + 285 = 342</math></p>  	<p><b>Expanded</b> Vertical Addition</p> <ul style="list-style-type: none"> <li>Teacher modelling</li> <li>Use manipulatives (dienes)</li> <li>Record symbolically e.g.</li> </ul> 	<ul style="list-style-type: none"> <li>Children use expanded method to record initially if they choose (to develop visual understanding).</li> </ul> <p>Use manipulatives (dienes)</p> <ul style="list-style-type: none"> <li>Teacher to demonstrate strong link with dienes to expanded vertical method</li> </ul> 	<ul style="list-style-type: none"> <li><b>Compact</b> vertical. Teacher to demonstrate strong link with expanded to compact method</li> </ul>  <p>Only move to compact method when children are secure in their understanding of the place value of the numbers; the expanded method.</p>	<p>Empty</p> <p>numbrelines (writing own)</p> <p>Dienes</p>	<p>+, add, addition, more, plus</p> <p>sum, total altogether score double, near double one more, two more... ten more... one hundred more how many more to make...? how many more is... than...? how much more is...?</p>
<b>S</b> <b>t</b> <b>a</b> <b>g</b> <b>e</b> <b>F</b> <b>o</b> <b>u</b> <b>r</b>	<p>Expanded vertical</p> <p><math>789 + 642 = 1431</math></p>  <ul style="list-style-type: none"> <li>Teacher modelling</li> <li>Use manipulatives (dienes)</li> <li>Children not to focus on recording expanded method</li> <li>Teacher to demonstrate strong link to compact method</li> </ul>	<p>Expanded vertical</p> <p><math>5735 + 562 = 6297</math></p> 	<p>Compact vertical</p> <p><math>5735 + 562 = 6297</math></p> 		<p>Dienes</p>	<p>add, addition, more, plus, increase sum, total, altogether score double, near double how many more to make...?</p>	
<b>S</b> <b>t</b> <b>a</b> <b>g</b> <b>e</b> <b>F</b> <b>i</b> <b>v</b> <b>e</b>	<p><b>Expanded</b> vertical</p> 	<p><b>Compact</b> vertical</p> 	<p>Dienes (with decimals)</p> <p>Place Value counters</p>	<p>add, addition, more, plus, increase sum, total, altogether score double, near double how many more to make...?</p>			

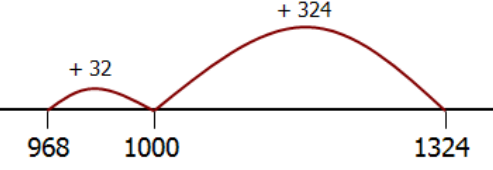
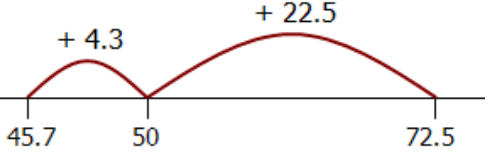
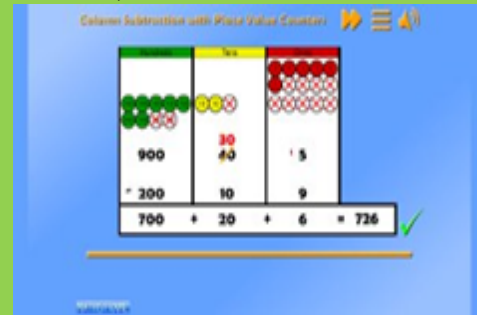
Stages	Expanded vertical $3.243 + 18.070 = 21.313$		Compact	Place Value counters	add, addition, more, plus
	$\begin{array}{r} 3.243 \\ + 18.070 \\ \hline 0.003 \\ 0.110 \\ 0.200 \\ 21.000 \end{array}$		$\begin{array}{r} 3.243 \\ + 18.070 \\ \hline 21.313 \\ 1 \quad 1 \end{array}$	decimals) Place Value counters	sum, total, altogether score double, near double how many more to make...?

## Subtraction




	Progression of Skills		Manipulatives/ Concrete Objects	Vocabulary	
Initial Stages	<p>Practical or recorded using ICT.</p> <p>Chloe was playing in the maths area. "I need three more" she said as she added some cubes to the circle. She then realised she had more than her friend. "Oh, I have too many". She removed one. "Now we have the same".</p> <p>During a game of skittles outdoors Joseph knocked three numbered skittles down. He was able to calculate his score in his head.</p> <p><a href="#">[EYFS Profile exemplifications, STA]</a></p>	<p>Pictures/Objects</p> <p>I have five cakes. I eat two of them. How many do I have left?</p> <div style="text-align: center;">  </div> <div style="background-color: #f4a460; padding: 5px; margin-top: 10px;">             Might be recorded as: <math>5 - 2 = 3</math> </div>	<p>Symbolic</p> <p>Mum baked 9 biscuits. I ate 5. How many were left?</p> <div style="text-align: center;">  </div> <div style="background-color: #f4a460; padding: 5px; margin-top: 10px;">             [Might be recorded as: <math>9 - 5 = 4</math>]         </div>	<p>Numicon</p> <p>Straws</p> <p>Cubes</p> <p>Concrete objects (compare bears etc)</p> <p>Teacher beadstring/bar</p>	<p>take (away), leave how many are left/left over? how many have gone? one less, two less... ten less... how many fewer is... than...? difference between is the same as</p>

S t a g e O n e	Practical or recorded using ICT.	<b>Taking</b>	<b>Taking</b>			Numicon Straws	-, subtract, take (away)	
	Pupils use concrete objects and pictorial representations (eg place value counters, Dienes)	jumps of 1 (modelled using bead strings) $13 - 5 = 8$   Using drywipe numberlines	(efficient jumps) $13 - 5 = 8$  Using drywipe numberlines No number line – using known facts: $13 - 3 = 10$ $10 - 2 = 8$	<b>Counting on</b> – jumps of 1 (modelled using bead strings) $11 - 8 = 3$  	<b>Counting on</b> (efficient jumps) With, or without, number line (using known facts) $8 + 2 = 10$ $10 + 1 = 11$	Concrete objects (compare bears etc) Beadstrings Numberlines (drywipe)	leave how many are left/left over? how many have gone? one less, two less, ten less... how many fewer is... than...? how much less is...? difference between half, halve =, equals, sign, is the same as	
S t a g e T w o	Pupils use concrete objects and pictorial representations and mental strategies (eg place value counters, Dienes)	Investigations with tens and ones equipment e.g. dienes, numicon... Pictorial representation Symbolic representation	 <b>Counting on</b> $84 - 48 = 36$ [Also jumps can be in 10s/1s] Using empty numberlines – progress from drywipe to drawing their own	<b>Partitioning</b> $84 - 48 =$ $84 - 8 - 40$ Begin with taking the unit away. $84 - 8 = 76$ $76 - 40 = 36$	Practical/visual images $95 - 60 = 35$  Symbolic etc... 	<i>Recording subtraction in columns supports place value and prepares for formal written methods with larger numbers.</i> $90$ and $8$ $30$ and $5$ $60$ and $3$ $98 - 35 = 63$	Numicon Straws Cubes Empty numberlines Dienes	-, subtract, subtraction, take (away), minus leave, how many are left/left over? one less, two less... ten less... one hundred less how many fewer is... than...? how much less is...? difference between half, halve =, equals, sign, is the same as tens boundary

S t a g e T h r e e	Use formal written methods of columnar addition TU - TU HTU - TU HTU - HTU	 <b>Counting on</b> $436 - 389 = 47$	Expanded columns  – no decomposition	Model subtraction using dienes (begin with subtractions that don't require decomposition and then move on to decomposition). $874 - 523 = 351$ $\begin{array}{r} 874 \\ - 523 \\ \hline 351 \end{array}$ (no decomposition)	<b>Expanded</b> $60 \overline{) 1}$ <b>Decomposition</b> $773 - 458 = 315$	<b>Decomposition NB decompose just one column initially</b> $\begin{array}{r} 8 \quad 12 \quad 1 \\ 9 \quad 3 \quad 2 \\ - 4 \quad 5 \quad 7 \\ \hline 4 \quad 7 \quad 5 \end{array}$ $932 - 457 = 475$	Empty numberlines (writing own) Dienes	-, subtract, subtraction, take (away), minus leave, how many are left/left over? one less, two less... ten less... one hundred less how many fewer is... than...? how much less is...? difference between half, halve =, equals,
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								sign, is the same as tens boundary, hundreds boundary
<b>Stage Four</b>	Use formal written methods of <b>columnar subtraction</b> .  HTU - HTU ThHTU - TU ThHTU - HTU ThHTU - ThHTU	 <p>Counting on</p> $1324 - 968 = 356$	<p><b>Decomposition: 1374 - 968 = 406</b> (model with dienes)</p> $\begin{array}{r} 1000 \text{ and } 300 \text{ and } 70 \text{ and } 4 \\ - \quad \quad 900 \text{ and } 60 \text{ and } 8 \\ \hline \end{array}$ $\begin{array}{r} 1300 \text{ and } 60 \text{ and } 14 \\ - \quad 900 \text{ and } 60 \text{ and } 8 \\ \hline 400 \text{ and } 0 \text{ and } 6 \end{array}$	<p><b>Decomposition</b></p> $\begin{array}{r} \phantom{0}6 \\ 1374 \\ - 968 \\ \hline 406 \end{array}$ <p>1374 - 968 = 406</p>	Dienes	subtract, subtraction, take (away), minus, decrease leave, how many are left/left over? difference between half, halve how many more/fewer is... than...? how much more/less is...? equals, sign, is the same as tens boundary, hundreds boundary inverse		
<b>Stage Five</b>	Subtract whole numbers >4 digits, including using <b>formal methods (columnar subtraction)</b> .  Decimals up to 2dp (eg 72.5 - 45.7)	<p>Counting on</p>  $72.5 - 45.7 = 26.8$	<p><b>Taking away</b> (no number line)</p> $72.5 - 45.7$ $72.5 - 40 = 32.5$ $32.5 - 5 = 27.5$ $27.5 - 0.7 = 26.8$	<p><b>Decomposition</b> (model with dienes/place value counters)</p> 	<p><b>Decomposition</b></p> $72.5 - 45.7 = 26.8$ $\begin{array}{r} \phantom{0}7 \phantom{0} \phantom{0} \phantom{0} \phantom{0} \phantom{0} \phantom{0} \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\ 72.5 \\ - 45.7 \\ \hline 26.8 \end{array}$	Dienes (with decimals) Place Value counters	subtract, subtraction, take (away), minus, decrease leave, how many are left/left over? difference between half, halve how many more/fewer is... than...? how much more/less is...? equals, sign, is the same as tens boundary, hundreds boundary units boundary, tenths boundary inverse	
<b>Stage Six</b>	Solve multi-step problems in contexts, deciding which operations/methods to use and why. Decimals up to 3dp (Context: Measures)	See previous years					subtract, subtraction, take (away), minus, decrease leave, how many are left/left over? difference between half, halve how many more/fewer is... than...? how much more/less is...? equals, sign, is the same as tens boundary, hundreds boundary units boundary, tenths boundary inverse	



	Progression of Skills 			Manipulatives/ Concrete Objects	Vocabulary
<b>I n i t i a l</b>	Practical/ recorded using ICT (eg digital photos / pictures on IWB)  This domino is a double 4. How many spots does it have?	Pictures/Objects  How many socks in three pairs? 	Symbolic  3 pairs, 2 socks in each pair: 	Counting stick Concrete objects (eg socks, gloves etc) Numicon	Set, pair, group, times



S  
t  
a  
g  
e  
s



S  
t  
a  
g  
e  
O  
n  
e

Practical/recorded using ICT  
Pictures/Symbolic

There are five cakes in each bag.  
How many cakes are there in three bags?

Visual (eg modelled using bead strings)

$5 \times 3$  or  $3 \times 5$  [two, three times] or [three groups of two]

Arrays

$5 \times 2$  or  $2 \times 5$

Counting sticks  
Concrete examples of arrays (cake tins, egg boxes etc)  
Numicon

lots of, groups of  $\times$ , times, multiply

S  
t  
a  
g  
e  
T  
w  
o

Pictures/Symbolic

There are four apples in each box.

How many apples in six boxes?

Repeated addition

$5 \times 3$  or  $3 \times 5$

Arrays

$6 \times 4$  or  $4 \times 6$

Counting sticks  
Concrete examples of arrays (cake tins, egg boxes etc)  
Numicon

lots of, groups of  $\times$ , times, multiply, multiplied by multiple of once, twice, three times... ten times... times as (big, long, wide... and so on) repeated addition array row, column double

S  
t  
a  
g  
e  
T  
h  
r  
e  
e

GRID

$36 \times 4 = 144$

X	30	6
4	120	24

Partitioned

$36 \times 4 = 144$

$30 \times 4 = 120$

$6 \times 4 = 24$

Expanded

$36 \times 4 = 144$

36
x 4
(6 x 4) 24
(30 x 4) 120
144

Compact  $36 \times 4 = 144$

$$\begin{array}{r} 36 \\ \times 4 \\ \hline 144 \end{array}$$


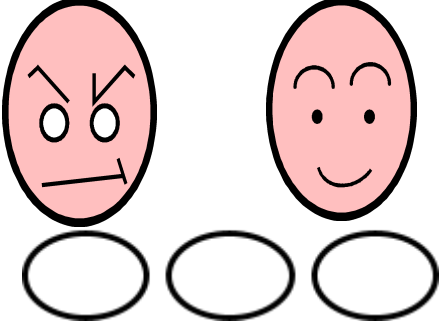

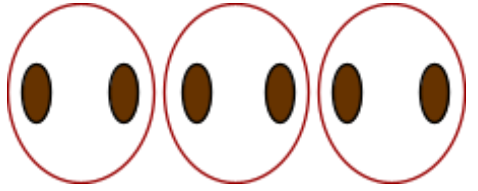
*Pupils develop reliable written methods for multiplication, starting with calculations of TU by U (progressing to formal written methods of short multiplication).*


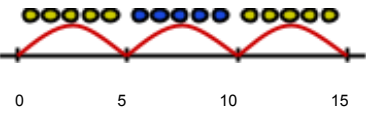
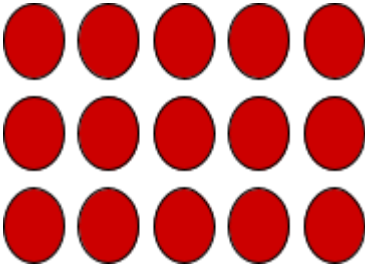
Counting stick  
Dienes

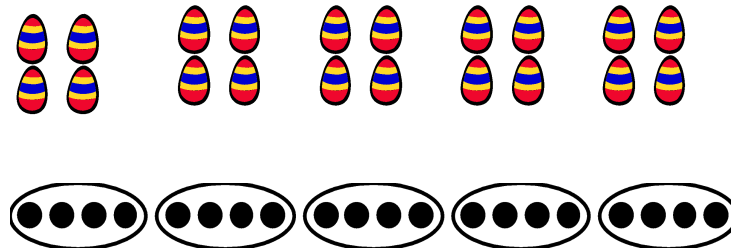
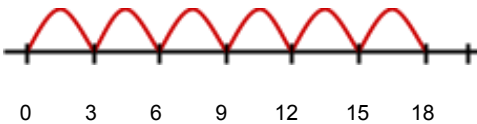
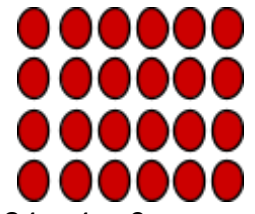
lots of, groups of  $\times$ , times, multiply, multiplication, multiplied by multiple of, product once, twice, three times... ten times... times as (big, long, wide... and so on) repeated addition array row, column double

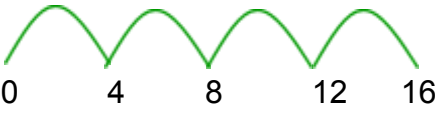
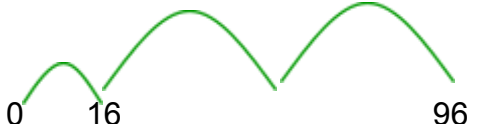
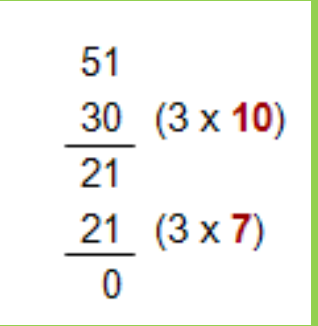
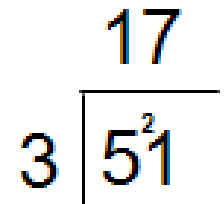
<b>S</b>  <b>t</b> <b>a</b> <b>g</b> <b>e</b> <b>F</b> <b>o</b> <b>u</b> <b>r</b>	Partitioned $43 \times 6 = 258$ (estimate: $40 \times 6 = 240$ ) $40 \times 6 = 240$ $3 \times 6 = 18$	Expanded $43 \times 6$ $18 \quad (3 \times 6)$ $240 \quad (40 \times 6)$ $258$	Compact $144$ $2 \quad 4$ $\times \quad 6$ $1 \quad 4 \quad 4$ $\quad \quad 2$	Grid $342 \times 7 = 2394$ $7 \quad 2100 \quad 280 \quad 14$	Expanded $237 \times 4$ (estimate: $250 \times 4 = 1000$ ) $237$ $\times \quad 4$ $28$ $120$ $800$ $948$	Compact $342 \times 7 = 2394$ $3 \quad 4 \quad 2$ $\times \quad \quad 7$ $2 \quad 3 \quad 9 \quad 4$ $\quad \quad 2 \quad 1$	Counting stick lots of, groups of times, multiplied...	multiplication, multiplied by multiple of, product once, twice, three times... ten times... times as (big, long, wide... and so on) repeated addition array row, column double																	
<b>S</b>  <b>t</b> <b>a</b> <b>g</b> <b>e</b> <b>F</b> <b>i</b> <b>v</b> <b>e</b>	Compact $2741 \times 6 = 16446$ (estimate $3000 \times 6 = 18000$ ) $2 \quad 7 \quad 4 \quad 1$ $\times \quad \quad \quad 6$ $1 \quad 6 \quad 4 \quad 4 \quad 6$ $\quad \quad 4 \quad 2$	Grid $47 \times 36 = 1692$ (estimate $50 \times 40 = 2000$ ) <table border="1" style="display: inline-table;"> <tr><td><math>\times</math></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>	$\times$	40	7		30	1200	210	1410	6	240	42	282				1692	Expanded $27 \times 34 = 918$ $27$ $\times 34$ $28 \quad (7 \times 4)$ $80 \quad (20 \times 4)$ $210 \quad (7 \times 30)$ $600 \quad (20 \times 30)$ $918$ (estimate $30 \times 30 = 900$ )	Compact $24 \times 16 = 384$ $2$ $2 \quad 4$ $\times \quad 1 \quad 6$ $2 \quad 4 \quad 0$ $1 \quad 4 \quad 4$ $3 \quad 8 \quad 4$ (estimate $25 \times 15 = 375$ )	$1 \quad 2$ $1 \quad 2 \quad 4$ $\times \quad \quad 2 \quad 6$ $2 \quad 4 \quad 8 \quad 0$ $7 \quad 4 \quad 4$ $3 \quad 2 \quad 2 \quad 4$ $\quad \quad 1 \quad 1$ Compact $124 \times 26 = 3224$ [see Y6 – demonstrating commutativity]	Counting stick lots of, groups of times, multiply, multiplication, multiplied by multiple of, product once, twice, three times... ten times... times as (big, long, wide... and so on) repeated addition array row, column double,			
$\times$	40	7																							
30	1200	210	1410																						
6	240	42	282																						
			1692																						
<b>S</b>  <b>t</b> <b>a</b> <b>g</b> <b>e</b> <b>S</b> <b>i</b> <b>x</b>	Compact $256 \times 18 = 4608$ (estimate $250 \times 20 = 5000$ ) $256$ $\times \quad 18$ $2560$ $2048$ $4608$ $\quad \quad 1$	Compact $124 \times 26 = 3224$ $1 \quad 2$ $1 \quad 2 \quad 4$ $\times \quad 2 \quad 6$ $7 \quad 4 \quad 4$ $2 \quad 4 \quad 8 \quad 0$ $3 \quad 2 \quad 2 \quad 4$ $\quad \quad 1 \quad 1$ [NB See Y5 method – demonstrating commutativity]	Grid $4.7 \times 8 = 37.6$ (estimate $5 \times 8 = 40$ ) <table border="1" style="display: inline-table;"> <tr><td><math>\times</math></td><td>4</td><td>0.7</td><td></td></tr> <tr><td>8</td><td>32</td><td>5.6</td><td>3</td></tr> </table>	$\times$	4	0.7		8	32	5.6	3	Compact $4.7 \times 8 = 37.6$ (estimate $5 \times 8 = 40$ ) $4.7$ $\times \quad 8$ $37.6$ $\quad \quad 5$ [Or $47 \times 8$ , then divide the solution by 10.]	Grid $5.65 \times 9 = 50.85$ (estimate $6 \times 9 = 54$ ) <table border="1" style="display: inline-table;"> <tr><td><math>\times</math></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> [Or compute $565 \times 9$ , then divide the solution by 100.] (Move onto compact method when children are ready)	$\times$	5	0.6	0.05		9	45	5.4	0.45	50.85	Counting stick lots of, groups of times, multiply, multiplication, multiplied by multiple of, product once, twice, three times... ten times... times as (big, long, wide... and so on) repeated addition array, row, column double,	
$\times$	4	0.7																							
8	32	5.6	3																						
$\times$	5	0.6	0.05																						
9	45	5.4	0.45	50.85																					

# Division

	Progression of Skills 	Manipulatives/ Concrete Objects	Vocabulary
Initial Stages	<p>Practical / recorded using ICT (eg digital photos/pictures on IWB)</p> <p>Pictures/Objects</p> <p>6 cakes shared between 2</p>  <p>6 cakes put into groups of 2</p> <p>Symbolic</p> <p>6 cakes shared between 2</p>   <p>There are 8 raisins. Take half of them. How many do you have?</p> <p>Share the 10 grapes between 2 people.</p>	<p>Concrete equipment (compare bears, fruit etc)</p> <p>Numicon</p>	<p>Share</p> <p>Group set</p>

<b>Stage One</b>	<p>Practical/recorded using ICT</p> <p>There are 14 people on the bus. Half of them get off. How many remain on the bus?</p> <p>There are 20 people in the class. One quarter are boys. How many boys are there?</p>	<p>Pictures/Symbolic</p> <p>How many apples in each bowl if I share 12 apples between 3 bowls?</p> 	<p>Visual (modelled using bead strings)</p> <p><math>15 \div 5 = 3</math></p> 	<p>Arrays (modelled by teacher)</p> <p><math>15 \div 5 = 3</math></p> 	<p>Concrete</p> <p>equipment (compare bears, fruit etc) Concrete arrays Numicon Beadstrings</p>	<p>halve share, share equally</p> <p>two each, three each... group in pairs, set, groups, times</p>

<b>Stage Two</b>	<p>Pictures/Symbolic</p> <p>Four eggs fit in a box. How many boxes would you need to pack 20 eggs?</p> 	<p>Visual (modelled using bead strings)</p> <p><math>18 \div 3 = 6</math></p> 	<p>Arrays</p> <p>Find <math>\frac{1}{4}</math> of 24</p>  <p><math>24 \div 4 = 6</math></p>	<p>Partitioning (using known facts from 2, 5 and 10 times table)</p> <p><math>32 \div 2 = 16</math></p> <p><math>20 \div 2 = 10</math></p> <p><math>12 \div 2 = 6</math></p>	<p>Numicon Beadstrings Concrete arrays</p>	<p>halve share, share equally one each, two each, three each... group in pairs, threes... tens equal groups of <math>\div</math>, divide, divided by, divided into left, left over</p>

<b>Stage Three</b>	<p>Empty Numberline (chunking)</p> <p><math>96 \div 4 = 24</math></p>  <p><math>4 \times 4</math></p>  <p><math>20 \times 4</math></p>	<p>Multiples of the divisor (Using known multiplication facts and multiples of those facts)</p> <p><math>85 \div 5 = 17</math></p> <p><math>10 \times 5 = 50</math> <math>7 \times 5 = 35</math></p>	<p>Chunking (Expanded method)</p> <p><math>51 \div 3 = 17</math></p> 	<p>Compact method (Teach in parallel with chunking)</p> <p><math>51 \div 3 = 17</math></p> 	<p>Dienes</p>	<p>halve share, share equally one each, two each, three each... group in pairs, threes... tens equal groups of <math>\div</math>, divide, division, divided by, divided into left, left over, remainder</p>

<b>St a g e F o u r</b>	Multiples of the divisor $98 \div 7 = 14$ $10 \times 7 = 70$ $4 \times 7 = 28$	Compact method $98 \div 7 = 14$	Multiples of the divisor $252 \div 7 = 36$ $30 \times 7 = 210$ $6 \times 7 = 42$	Chunking (Expanded method) $252 \div 7 = 36$	Compact method $252 \div 7 = 36$	Place Value Counters	halve share, share equally three each... group in pairs, threes... tens equal groups of divide, division, divided by, divided into remainder factor, quotient, divisible by inverse
<b>St a g e F i v e</b>	Chunking (with remainders) $346 \div 8 = 43 \text{ r}2$ (estimate $>40, <50$ )		Compact method (with remainders) $432 \div 5 = 86 \text{ r}2$ (estimate: $400 \div 5 = 80$ )	$8520 \div 6 = 1420$		Place Value Counters	halve share, share equally, one each, two each, three each... group in pairs, threes... tens equal groups of divide, division, divided by, divided into remainder factor, quotient, divisible by inverse
<b>St a g e S i x</b>	Partitioning $43.4 \div 7 = 6.2$ (estimate $42 \div 7 = 6$ ) $6 \times 7 = 42$ $0.2 \times 7 = 1.4$	Chunking (Expanded method) $25.6 \div 8 = 3.2$ (estimate $>3, <4$ )	Compact method $43.68 \div 7 = 6.24$ (estimate: $42 \div 7 = 6$ ) [Or compute $4368 \div 7$ , then divide the solution by 100.]	Compact method (remainder as a fraction) $496 \div 11 = 45 \frac{1}{11}$	Long division (compact method) $432 \div 15 = 28.8$	Place Value Counters	Hlave, share, share equally one each, two each, three each... group in pairs, threes... tens equal groups of divide, division, divided by, divided into remainder factor, quotient, divisible by inverse