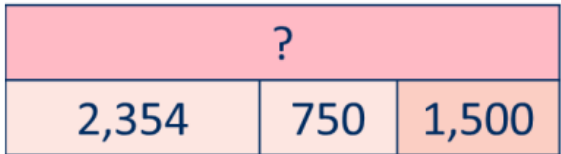
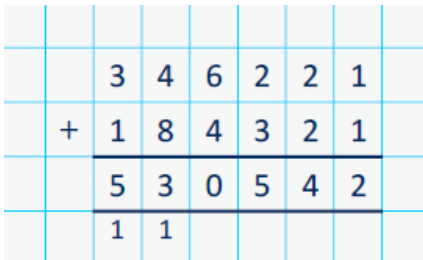
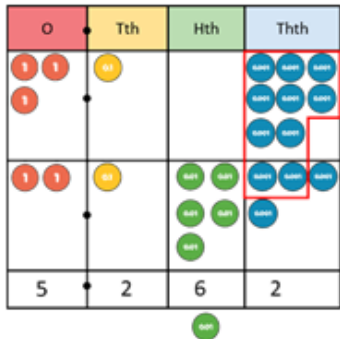
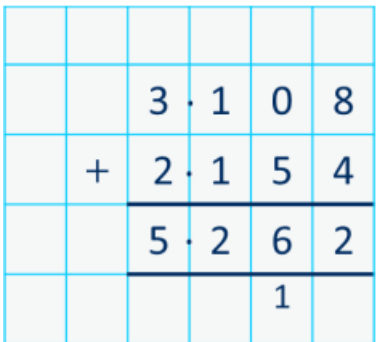
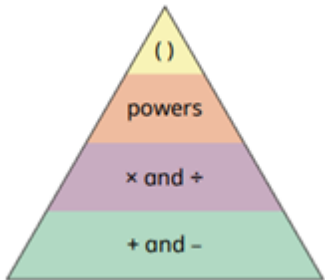
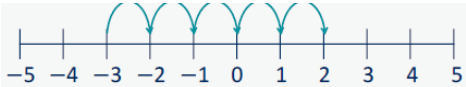
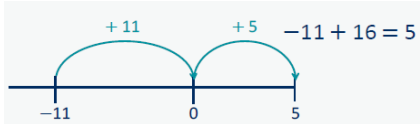
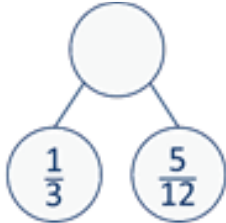
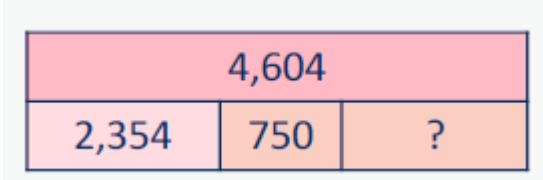
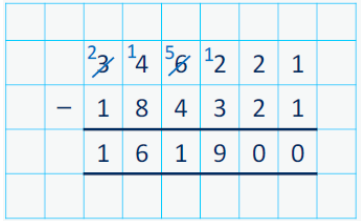


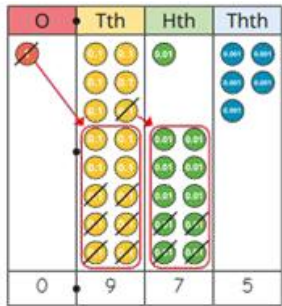
Year 6 Addition			
Concept	Concrete	Pictorial	Abstract
Add integers up to 10 million Encourage children to estimate and use inverse operations to check answers to calculations.			
Add decimals with up to 3 decimal places Progress to numbers with digits in different place value columns. Encourage children to check that they have lined up the columns correctly.	I do/do not need to make an exchange because ...		
Order of operations Calculations in brackets	... has greater priority than ..., so the first part of the calculation I need to do is ...	$(3 + 4) \times 2 = 14$	$(3 + 4) \times 2 = 14$

should be done first. Multiplication and division should be performed before addition and subtraction. *When no brackets are shown and the operations have the same priority, work left to right.			
Negative numbers Children add to negative numbers and carry out calculations which cross 0	... plus ... is equal to ... 		$-11 + 16 = 5$

Add fractions Convert fractions to the same denominator before adding. Progress from fractions where one denominator is a multiple of the other, to any fractions and then to mixed numbers.			$\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$
Year 6 Subtraction			
Concept	Concrete	Pictorial	Abstract
Subtract integers up to 10 million Encourage children to estimate and use inverse operations to check answers to calculations.			

Subtract decimals with up to 3 decimal places
Progress from the same number of decimal and whole number places to a different number of decimal and whole number places.

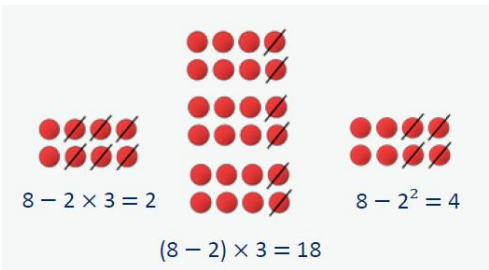
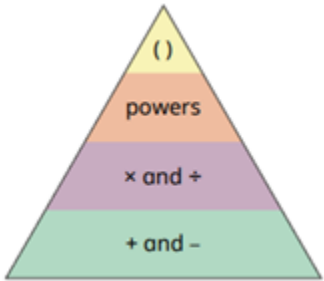
I do/do not need to make an exchange because ...



		⁰ 1	¹⁵ 6	11	5
	-	0	6	4	
		0	9	7	5

Order of operations
Children learn the order of priority for operations in a calculation. Calculations in brackets should be done first. Multiplication and division should be

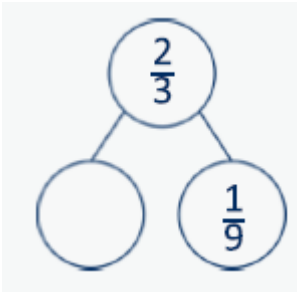
... has greater priority than ... , so the first part of the calculation I need to do is ...



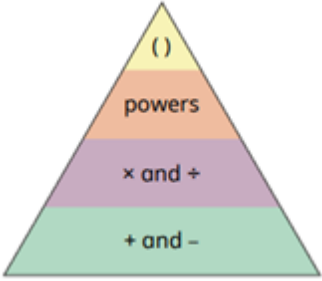
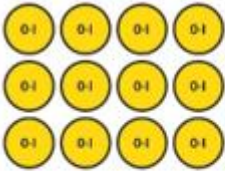
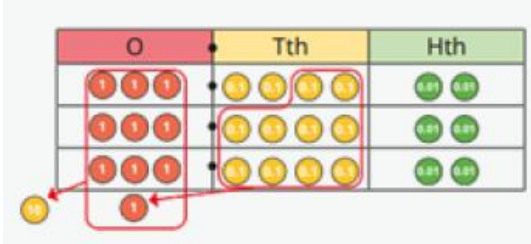
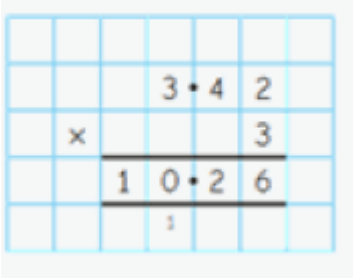
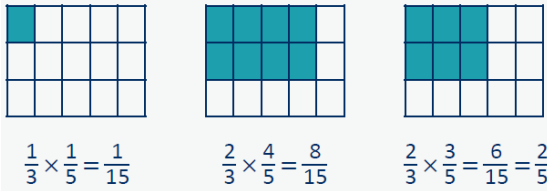
$$8 - 2 \times 3 = 2$$

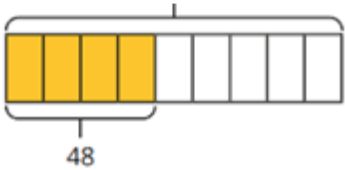
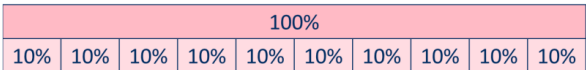
$$(8 - 2) \times 3 = 18$$

$$8 - 2^2 = 4$$

performed before addition and subtraction.			
Subtract fractions Convert fractions to the same denominator before subtracting. Progress from fractions where one denominator is a multiple of the other, to any fractions and then subtracting from a mixed number.			$\frac{2}{3} - \frac{1}{9} = \frac{6}{9} - \frac{1}{9} = \frac{5}{9}$

Year 6 Multiplication																																						
Concept	Concrete	Pictorial	Abstract																																			
Multiply multi-digit numbers up to 4 digits by a 2 digit whole number using the formal written method of long multiplication.			To multiply by a 2-digit number, first multiply by the ones, then multiply by the tens and then find the total. <table><tr><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td>2</td><td>7</td><td>3</td><td>9</td></tr><tr><td>×</td><td></td><td></td><td>2</td><td>8</td></tr><tr><td>2</td><td>2</td><td>1</td><td>9</td><td>1</td></tr><tr><td>5</td><td>4</td><td>7</td><td>8</td><td>0</td></tr><tr><td>7</td><td>6</td><td>6</td><td>9</td><td>2</td></tr><tr><td colspan="5">1</td></tr></table>	TTh	Th	H	T	O		2	7	3	9	×			2	8	2	2	1	9	1	5	4	7	8	0	7	6	6	9	2	1				
TTh	Th	H	T	O																																		
	2	7	3	9																																		
×			2	8																																		
2	2	1	9	1																																		
5	4	7	8	0																																		
7	6	6	9	2																																		
1																																						
Multiply by 10, 100 and 1,000 Some children may over-generalise that multiplying by a power of 10 always results in adding zeros.		To multiply by 10/100/1,000, I move all the digits ... places to the left. ... is 10/100/1,000 times the size of ... <table><tr><td>M</td><td>HTh</td><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td><td>Th</td><td>H</td><td>T</td><td>O</td><td>Tth</td><td>Hth</td><td>Thth</td></tr><tr><td></td><td></td><td></td><td></td><td>••</td><td>•••</td><td>•••</td><td></td><td></td><td></td><td>•</td><td>••</td><td>••</td><td>•••</td></tr></table>	M	HTh	TTh	Th	H	T	O	Th	H	T	O	Tth	Hth	Thth					••	•••	•••				•	••	••	•••	$234 \times 10 = 2,340$ $234 \times 100 = 23,400$ $234 \times 1,000 = 234,000$ $0.234 \times 10 = 2.34$ $0.234 \times 100 = 23.4$ $0.234 \times 1,000 = 234$							
M	HTh	TTh	Th	H	T	O	Th	H	T	O	Tth	Hth	Thth																									
				••	•••	•••				•	••	••	•••																									
Order of operations Calculations in brackets should be done first.	... has greater priority than ..., so the first part of the calculation I need to do is ...	<table><tr><td> ••••• ••••• $(3 + 4) \times 2 = 14$ ••• ••••• ••••• ••••• $3 + 4^2 = 19$ ••• ••••• ••••• $3 + 4 \times 2 = 11$ </td><td> $(3 + 4) \times 2 = 14$ $3 + 4^2 = 19$ $3 + 4 \times 2 = 11$ </td></tr></table>	••••• ••••• $(3 + 4) \times 2 = 14$ ••• ••••• ••••• ••••• $3 + 4^2 = 19$ ••• ••••• ••••• $3 + 4 \times 2 = 11$	$(3 + 4) \times 2 = 14$ $3 + 4^2 = 19$ $3 + 4 \times 2 = 11$																																		
••••• ••••• $(3 + 4) \times 2 = 14$ ••• ••••• ••••• ••••• $3 + 4^2 = 19$ ••• ••••• ••••• $3 + 4 \times 2 = 11$	$(3 + 4) \times 2 = 14$ $3 + 4^2 = 19$ $3 + 4 \times 2 = 11$																																					

Multiplication and division should be performed before addition and subtraction.	 A pyramid diagram showing the order of operations from top to bottom: 1. Brackets $()$ 2. Powers $^{\circ}$ 3. Multiplication $\times$ and Division $\div$ 4. Addition $+$ and Subtraction $-$		
Multiply decimals by integers This is the first time children multiply decimals by numbers other than 10, 100 or 1,000 Encourage them to make links with known facts and whole number multiplication.	 3 groups of 4 tenths is 12 tenths. 4 groups of 3 tenths is 12 tenths.		
Multiply fractions by fractions Encourage children to give answers in their simplest form.		 $\frac{1}{3} \times \frac{1}{5} = \frac{1}{15}$ $\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$ $\frac{2}{3} \times \frac{3}{5} = \frac{6}{15} = \frac{2}{5}$	$\frac{1}{3} \times \frac{1}{5} = \frac{1}{15}$

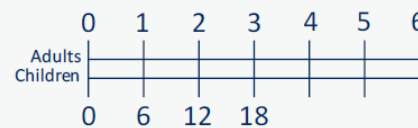
Find the whole Children multiply to find the whole from a given part.			$\frac{1}{9} = 48 \div 4 = 12$ $9 \times 12 = 108$ $\frac{4}{9} \text{ of } \mathbf{108} = 48$
Calculate percentages Children first learn how to find 1%, 10%, 20%, 25% and 50% before using multiples of these amounts to find any percentage.			To find 30%, I can find 10% and then multiply it by 3 To find 23%, I can use $10\% \times 2$ and $1\% \times 3$ To find 99%, I can find 1%, then subtract from 100% $50\% \text{ of } \dots = \dots \div 2$ $25\% \text{ of } \dots = \dots \div 4$

Calculations involving ratio
Encourage children to see the multiplicative relationship between ratios.
They will need to multiply or divide each value by the same number to keep the ratio equivalent.
Double number lines and ratio tables help children to see both horizontal and vertical multiplicative relationships.

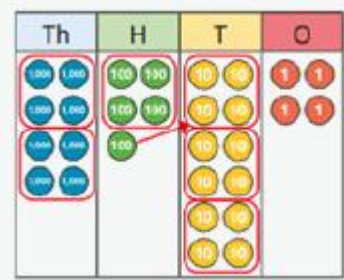
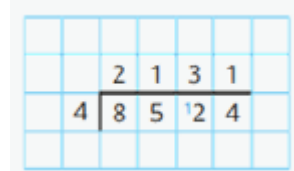
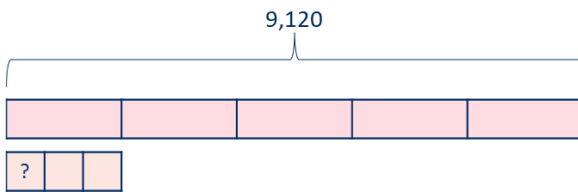
For every ... , there are ...

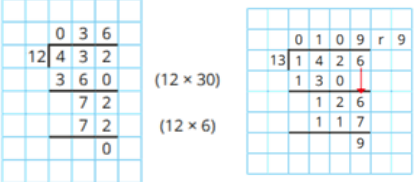
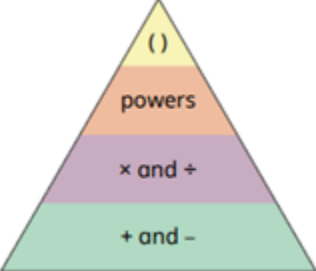
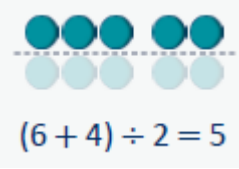


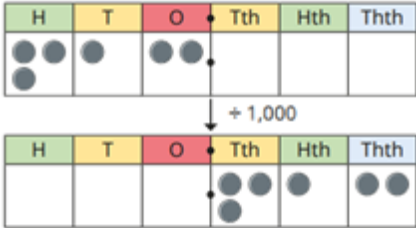
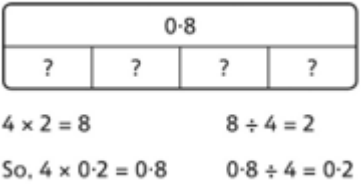
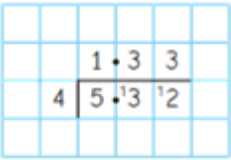
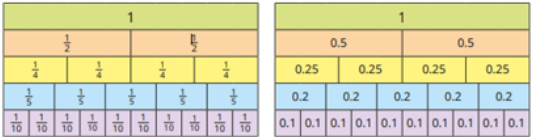
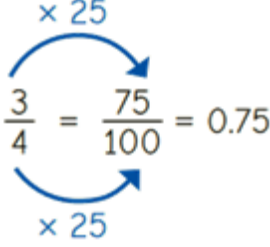
For every 1 adult on a school trip, there are 6 children.

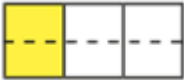
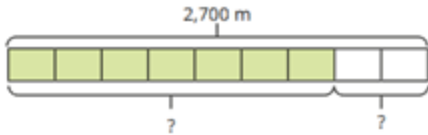
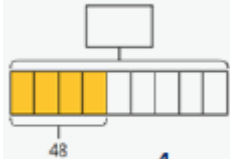
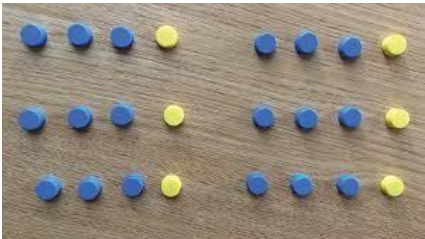


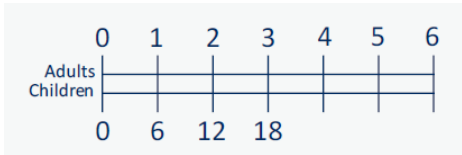
The ratio of adults to children is 1 :
6

Year 6 Division			
Concept	Concrete	Pictorial	Abstract
Short division Encourage children to interpret remainders in context.	There are ... groups of ... hundreds/tens/ones/ in ... I can exchange 1 ... for 10 ...		
Mental strategies Include partitioning and number line strategies outlined in Y5 as well as division using factors.	To divide by ... , I can first divide by ... and then divide the answer by ...		$9,120 \div 15 = 9,120 \div 5 \div 3$

Long division The long division method is introduced for the first time. Two alternative methods are shown.			 (12 × 30) (12 × 6)
Order of operations Calculations in brackets should be done first, then powers. Multiplication and division should be performed before addition and subtraction.	... has greater priority than ..., so the first part of the calculation I need to do is ... 		$(6 + 4) \div 2 = 5$

Divide by 10, 100 and 1,000 Encourage children to notice that dividing by 100 is the same as dividing by 10 twice, and that dividing by 1,000 is the same as dividing by 10 three times.	To divide by ... , I move the digits ... places to the right.		$312 \div 10 = 31.2$ $312 \div 100 = 3.12$ $312 \div 1,000 = 0.312$
Divide decimals by integers This is the first time children divide decimals by numbers other than 10, 100 or 1,000	 Use place value equipment to divide decimals into equal groups. <i>8 tenths divided into 4 groups. 2 tenths in each group.</i>		
Decimal and fraction equivalents	The fraction ... is equivalent to the decimal ... 		$\frac{1}{5} = 0.2 \quad \frac{2}{5} = 0.4 \quad \frac{3}{5} = 0.6$

Divide a fraction by an integer This is the first time children divide fractions by an integer.	... ones divided by 2 is ... ones so ... sevenths divided by 2 is ... sevenths. 	I am dividing by ... , so I can split each part into ... equal parts. 	... is equivalent to ... so ... $\div$... = ... $\div$...  $\frac{2}{3} = \frac{4}{6}$ so $\frac{2}{3} \div 4 = \frac{4}{6} \div 4 = \frac{1}{6}$
Fraction of an amount Children divide and multiply to find fractions of an amount. Bar models can still be used to support understanding where needed.			 $\frac{4}{9}$ of $\underline{\hspace{1cm}}$ = 48
Calculations involving ratio Encourage children to see the multiplicative relationship between ratios. They will need to multiply	For every ... , there are ... 	For every 1 adult on a school trip, there are 6 children. adults  children 	The ratio of adults to children is 1 : 6

or divide each value by the same number to keep the ratio equivalent. Double number lines and ratio tables help children to see both horizontal and vertical multiplicative relationships.																																			
Calculate percentages Children first learn how to find 1%, 10%, 20%, 25% and 50% before using multiples of these amounts to find any percentage.	There are ... lots of ... % in 100% To find ... %, I need to divide by ... <table data-bbox="407 930 931 1045"><tr><td colspan="4">100%</td></tr><tr><td colspan="2">50%</td><td colspan="2">50%</td></tr><tr><td>25%</td><td>25%</td><td>25%</td><td>25%</td></tr></table>	100%				50%		50%		25%	25%	25%	25%	<table data-bbox="965 845 1547 916"><tr><td colspan="10">100%</td></tr><tr><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td></tr></table>	100%										10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	To find 30%, I can find 10% and then multiply it by 3 To find 23%, I can use $10\% \times 2$ and $1\% \times 3$ To find 99%, I can find 1%, then subtract from 100% 50% of ... = $\dots \div 2$ 25 % of ... = $\dots \div 4$
100%																																			
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