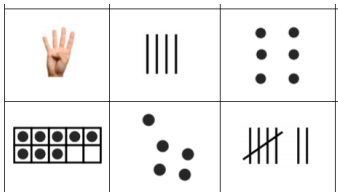
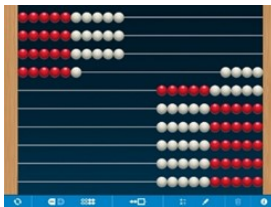
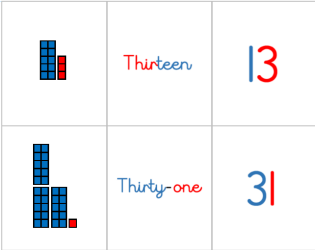
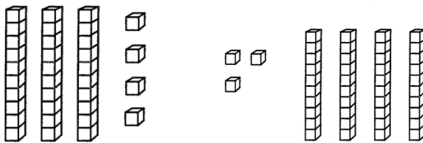
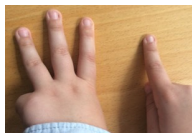
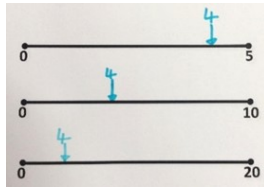
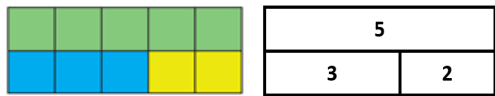
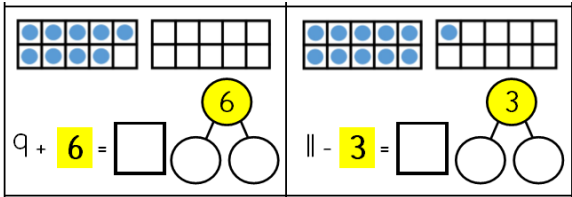
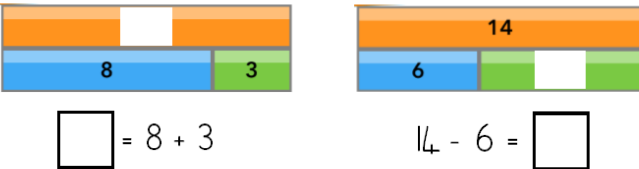
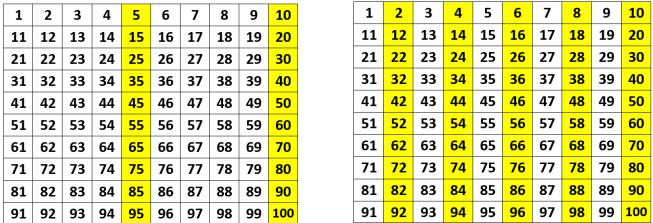
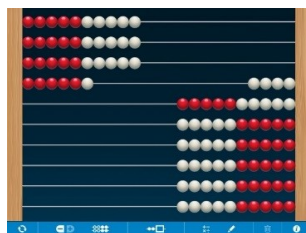
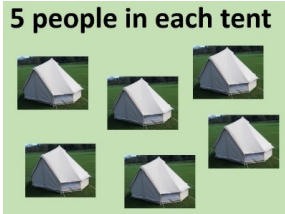
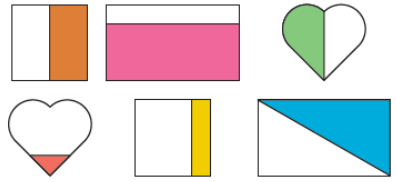
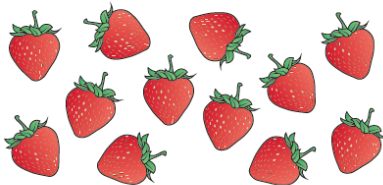
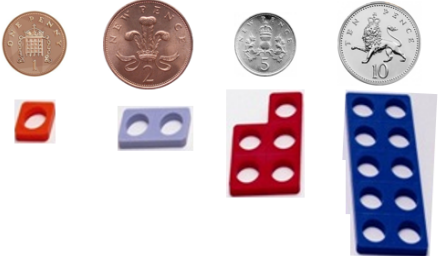
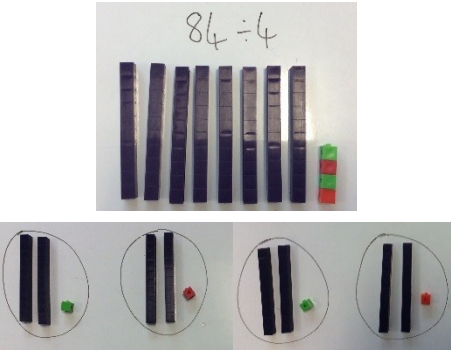
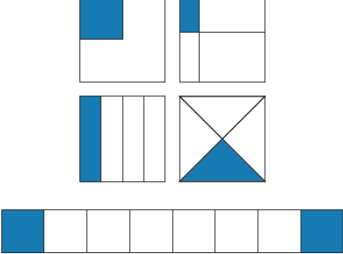
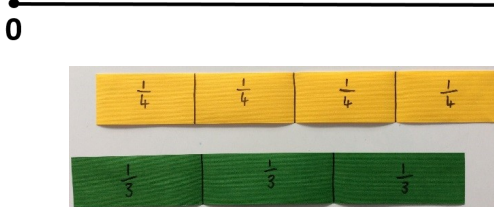
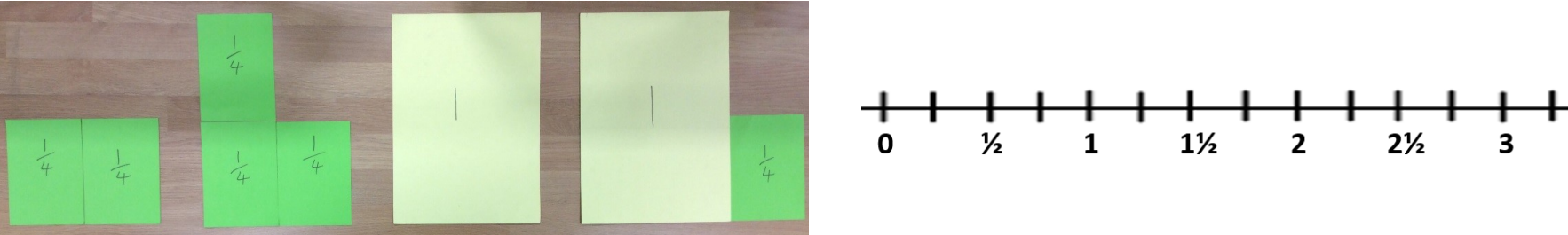


Objective	Visual representations		
Know 1 more/less in the range 1-100, focusing on bordering tens boundaries	Identify and show one more/less in different ways. Example game: one more/less bingo. 	Find missing numbers on number track, focusing on tens boundaries. 	Slavonic Abacus to show quantities 1-100 (iPad app 'Number Rack'). 
With visuals, discern teens from tens	Organise large quantities in groups of 10 e.g. with egg boxes or pipe cleaners. 	Use teens/tens matching cards. 	Identify and make 2-digit numbers with dienes, showing in different ways.  Is it 34? 
Able to represent 1-10 in a range of ways, working out small quantities without counting all items	Immediate recognition of Numicon, 10-frame images, tally charts and finger patterns. 	Represent numbers on fingers in different ways. 	Estimate position of numbers on blank number lines with different start/end numbers. 
Break down 1-10 in all possible ways, write number sentences using +, - and =	Subitizing games for regular and irregular dot patterns, with children visualising quantities in two parts. 	Arrangement of 2 colours of items e.g. in egg box 10-frame or with Numicon. 	Introduction of part-whole model from individuals squares/items to bars. 

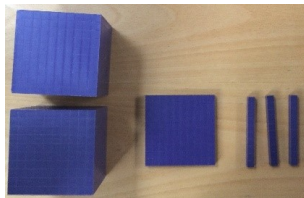
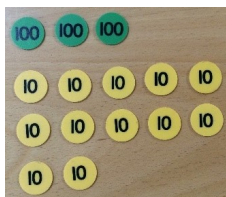
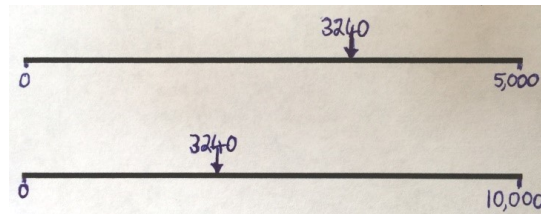
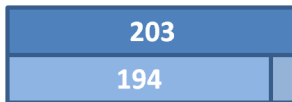
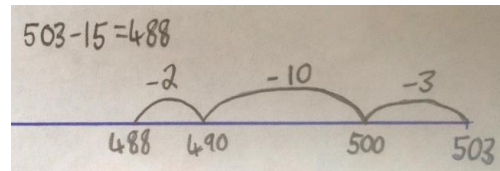
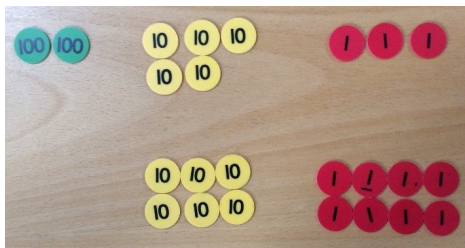
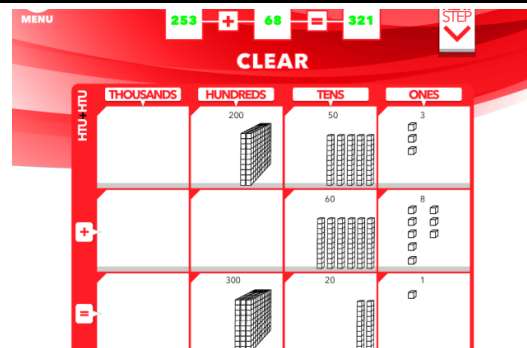
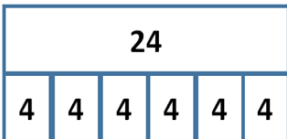
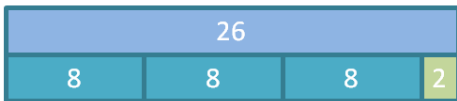
Objective Represent and use number bonds and related subtraction facts within 20	Visual representations 10-frames used when calculations border 10, used to visualise ‘how many to make 10, how many more?’  Bar models used to show structure of addition and subtraction calculations: children fill in the part not labelled. 
Count in multiples of 2, 5 and 10	100-square with columns highlighted used to support counting. The Slavonic Abacus (iPad app ‘Number Rack’) used to visualise quantity when counting.   Count in hidden groups of 2, 5 and 10. 
Recognise and make one-half in a range of ways (discern examples from non-examples); identify one-quarter	Half of a shape/capacity, number of objects, 10-frame half/double, half of length, half of an amount of money.  Colour half of each whole shape:  Circle half of this group of strawberries.  What is half of this amount?  
Link the value of coins to a matching visual	Match value of coins to Numicon pieces, use Numicon to support calculations involving money. 

Objective	Visual representations										
Represent numbers 1-100 in a range of ways, showing understanding of place value	Represent tens/teens using dienes, showing numbers in different ways. 	Partition 2-digits numbers using place-value cards. 	Estimate position of numbers on blank number lines with different start/end. 	Recognise amount on Slavonic Abacus, seeing tens and ones; find missing numbers on 100-square. 							
Use different calculation strategies for adding and subtracting one and two-digit numbers	Calculation within 30 using 10-frames, lead to use of number line, e.g. use egg-box 10-frames and app 'I See Addition and Subtraction'. 	Model calculation using partitioning with dienes. 	Bar modelling to show relationship between + and - (using words 'whole/parts'). Include spatial reasoning estimates. <table><tr><td>27</td></tr><tr><td>15 ?</td></tr></table><table><tr><td>12</td><td>15</td></tr><tr><td colspan="2">?</td></tr></table><table><tr><td>?</td></tr><tr><td>15 ?</td></tr></table>	27	15 ?	12	15	?		?	15 ?
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Understand x as repeated adding, find related x and ÷ facts from a number sentence	Numicon and images of repeated quantities show the link between + and x. 	Arrays show commutativity of multiplication. Columns/rows circled to link to division. 	Bar model shows relationship between whole/parts and makes links to division. 								

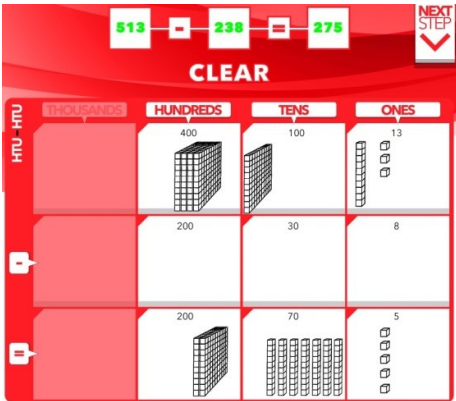
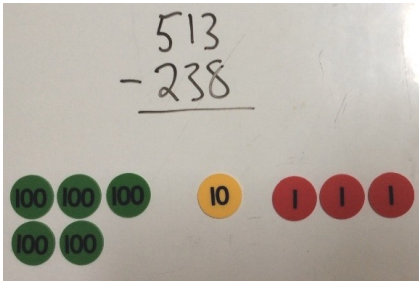
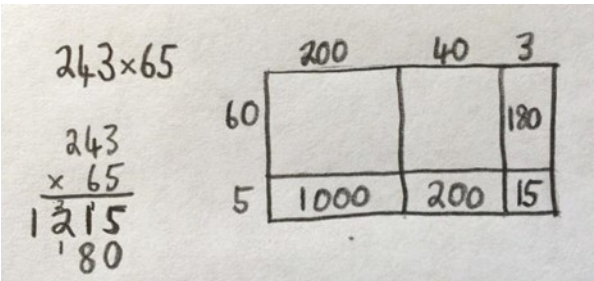
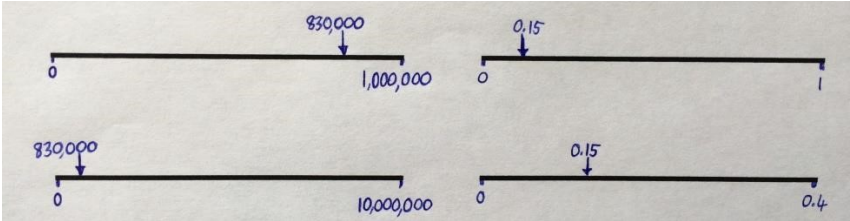
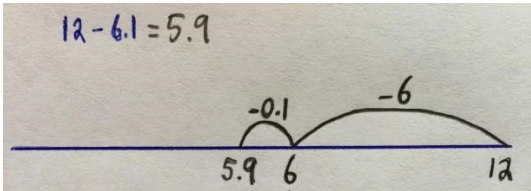
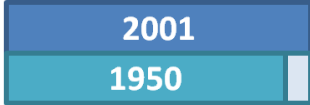
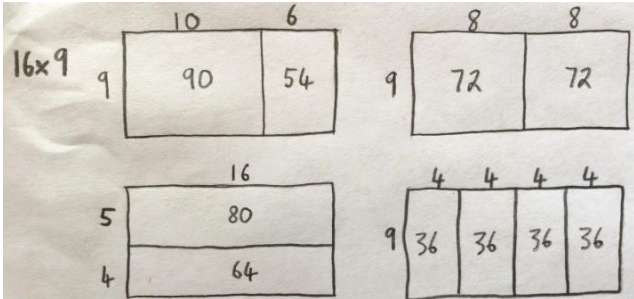
Objective	Visual representations		
Use sharing and grouping strategies for division, re-late division to finding unit fractions of quantities	Sharing supported by appropriate visuals, used where a large total is shared into few groups 	Grouping strategy modelled with Numicon: how many [divisors] in [dividend]? $20 \div 3 = 6r2$ 	Grouping context questions with supporting visuals. How many cars are needed to take 18 children to the match? 4 children per car. 
Represent fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ in a range of ways; order and recognise equivalence.	Fractions of areas/objects (and non-examples): Which of these diagrams are $\frac{1}{4}$ blue?  <i>Include fractions of containers</i>	Fractions of a length/number line: Estimate the position of $\frac{1}{4}$, $\frac{1}{3}$ and $\frac{3}{4}$ 	Fractions of quantity: The children can have $\frac{3}{4}$ of the cupcakes. 
Use halves and quarters as counting numbers, going over 1	Modelled with fraction cards and on a number line. 		

Objective	Visual representations
Represent 3-digit numbers in a range of ways, showing an understanding of place value	Make 3-digit numbers using dienes and place value cards, showing how they can be partitioned. Make the same number in different ways with place value coins. Estimate position of numbers on blank number lines with different start/end numbers.
Add and subtract ones, tens and hundreds to HTU, making realistic estimates	Dienes, place value coins and app 'I See Addition and Subtraction' model written addition and subtraction. Bar model shows subtraction as difference. Bar model shows subtraction as difference.
Understand the inverse relationship between $\times$ and $\div$; know $\times$ as repeated adding, use to derive related multiplication facts.	A range of images show multiplication as repeated addition. 2-colour arrays show distributive law. Bar model shows link between multiplication and division, and model division as sharing and grouping.

Objective	Visual representations
Use efficient formal written methods for multiplication and division	Division modelled using place value coins: Step 1 $92 \div 4$ $\begin{array}{r} 23 \\ 4 \overline{)92} \end{array}$ Step 2 $92 \div 4$ $\begin{array}{r} 2 \\ 4 \overline{)92} \end{array}$ Step 3 $92 \div 4$ $\begin{array}{r} 2 \\ 4 \overline{)92} \end{array}$ Step 4 $92 \div 4$ $\begin{array}{r} 23 \\ 4 \overline{)92} \end{array}$ 'How many [divisors] in [dividend]' shown using Numicon. $20 \div 3$ (how many 3s in 20?) and $20 \div 5$ (how many 5s in 20?): Multiplication modelled using place value coins: $\begin{array}{r} 23 \times 4 \\ \hline 20 \quad 3 \end{array}$
Simple unit/non-unit fractions represented in a range of ways; different fractions compared including equivalence	Identify fraction of shaded shape; position fractions on a number line; use fraction cards to show equivalence and compare fractions. True or false? $\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{2}$ Estimate the position of $\frac{1}{3}$, $\frac{1}{5}$ and $\frac{7}{10}$
Use quarters, halves and tenths as counting numbers going over 1	Modelled with fraction cards and on number lines.

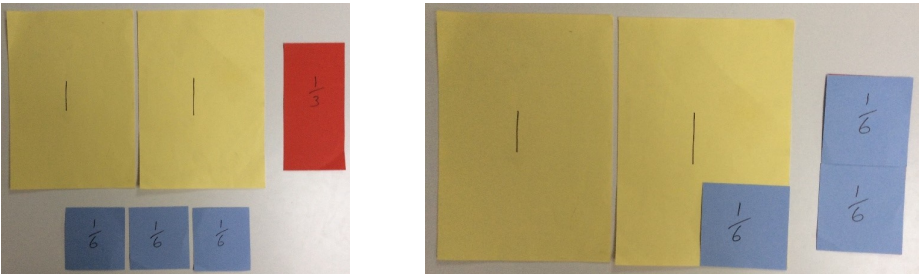
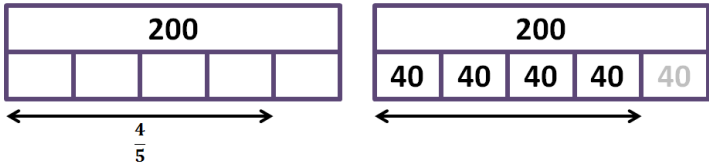
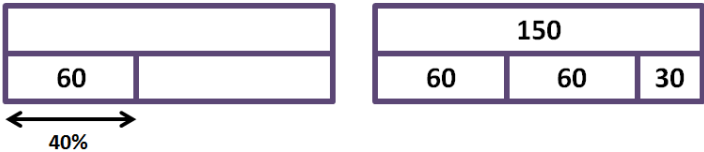
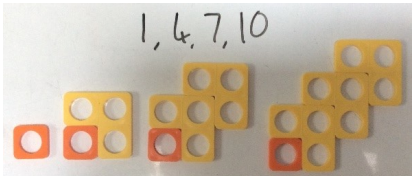
Objective	Visual representations	
Represent 4-digit numbers in a range of ways, showing understanding of place value	Make 4-digit numbers using dienes and place value coins, building numbers in different ways. 2,130  420 with three 100s and twelve 10s 	Estimate the position of numbers on blank number lines with different start/end numbers. 
Choose efficient mental strategies for adding and subtracting numbers	Round and adjust to calculate, model with appropriate visual 350-198 modelled with place value counters: take away 200, add 2.  	Choose whether to count on or count back, show with number line or bar model. 203 - 194  
Become fluent in written methods for addition and subtraction	Model vertical methods for addition and subtraction step-by-step using place value counters and iPad app 'I See Addition and Subtraction'. 253 + 68 	
Understand and represent multiplication and division in a range of ways; derive related facts from a given calculation.	Use arrays and bar models to derive related multiplication and division facts This image shows 4 x 6  Change the image to show 4 x 7 This image shows 4 x 6  Use the image to calculate 4 x 12	Understand and represent as 'how many [divisors] in [dividend]' using arrays and bar models, including remainders. Which divisions are shown by these images?  

Objective	Visual Representations
Use efficient formal written methods for multiplication and division of 3-digit numbers	Division modelled with place value counters. Written multiplication represented by area model—links made between grid method and compact method. $641 \div 3$ $3 \overline{) 641}$ 100100100 10101 $641 \div 3$ $3 \overline{) 641}$ 10101 1010 100100100 100100100 100100100 $641 \div 3$ $3 \overline{) 641}$ 101 1 10010 10010 10010 $641 \div 3$ $3 \overline{) 641}$ 11 100101 100101 100101 264×8 200604 8 160048032 200604 8 160048032 264 53 x8 2112
Find equivalent fractions, calculate fractions of amounts (unit and non-unit fractions)	Fraction cards and Lego used to show equivalence. $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{1}{8}$ $\frac{3}{4} = \frac{12}{16}$ Fractions of quantities shown using place value counters and bar models, presented in stages. $180 \div 3 = 60$ 101010 101010 101010 $\frac{3}{4}$ of 60 60 151515
Know decimal equivalents for quarters and halves, relating to division	Dividing length of a metre ruler into two/four equal parts. 10102030405060708090

Objective	Visual representations	
Represent the value of digits in numbers of up to 7-digits and decimals to thousandths	Make numbers in the range using place value coins, partitioning decimal values and showing the same number in different ways. 0.35  430 	
Choose efficient strategies and apply knowledge of place value when adding and subtracting	Model vertical methods for addition and subtraction step-by-step using iPad app 'I See Addition and Subtraction' or place value counters.  	
Develop a range of strategies for multiplication including efficient written methods	Compact written method made visual by area model. 	
	Estimate the position of numbers on blank number lines with different start/end numbers. 	
	Mental calculation methods modelled using appropriate visual, e.g. rounding and adjusting on a number line, bar model to show subtraction as difference. $12 - 6.1 = 5.9$  2001 - 1950 	
	Area model used to show multiplication where numbers are partitioned in different ways. 	

Objective	Visual representations
Develop a range of strategies for division including efficient written methods	Division modelled with place value counters. $641 \div 3$ 3 641 21 10010010010101 1001001001010 $641 \div 3$ 3 641 21 10101 1010 100 100 100 100 100 100 100 $641 \div 3$ 3 641 21 101 1 10010 10010 10010 $641 \div 3$ 3 641 213r2 11 1 100101 100101 100101 Bar model used to reinforce ‘how many [divisors] in [dividend]?’ $750 \div 150$ 750 150150150150150
Compare and order fractions, find equivalent fractions, add and subtract fractions.	Fraction cards used to compare, show equivalence and model calculations. $\frac{1}{6}$$\frac{1}{6}$$\frac{1}{6}$ $\frac{1}{6}$$\frac{1}{6}$ $\frac{1}{3}$$\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{12}$$\frac{1}{12}$ $\frac{1}{4}$ $\frac{1}{12}$$\frac{1}{12}$ Example: $\frac{3}{4} + \frac{1}{2}$ $\frac{1}{4}$$\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{2}$ $\frac{1}{4}$$\frac{1}{4}$ $\frac{1}{4}$$\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{2}$$\frac{1}{4}$
Find decimal equivalents for quarters, fifths and tenths, relating to division	Dividing length of a metre ruler into two/four/five equal parts.

Objective	Visual representations
Represent numbers of up to 8-digits and decimals to thousandths in a range of ways	Make numbers in a range of ways using place value coins, partitioning decimal values. 0.32 Estimate the position of numbers on blank number lines with different start/end numbers.
Carry out formal written methods of calculation for all four operations	Place value of numbers in addition and subtraction modelled using place value counters. 3.5 + 2.15 Multiplication visualised using area model. 243 × 65
Choose efficient strategies and apply flexible knowledge of number to calculate	Choose appropriate visuals to model structure of calculations, including modelling worded questions. 12 - 7.01 21 - 18.7 7.5 ÷ 2.5

Objective (Y6)	Visual representations
Add and subtract fractions with different denominators	Fraction cards to show conversion into common denominators and calculating over whole-number boundaries. Example: $2\frac{1}{3} - \frac{3}{6}$ 
Multiply and divide unit fractions and simple non-unit fractions	Area model diagrams to model a fraction being divided or multiplied by a fraction (modelled in two steps). 
Calculate percentages and fractions of quantities	Bar model visualises finding fraction/percentage of quantity and finding the whole given a percentage/fraction. Shown step-by-step. $\frac{4}{5} \times 200$  40% of a number is 60. What's the number? 
Describe linear number sequences, including using formulae in the form $y = mx + c$	Numicon and bar model used to model linear number sequences or equations. 1, 4, 7, 10  $y = 3x + 5$ 