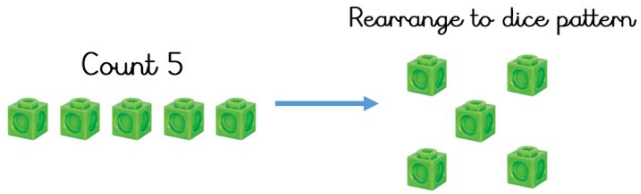
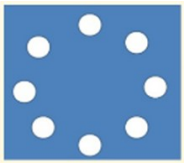
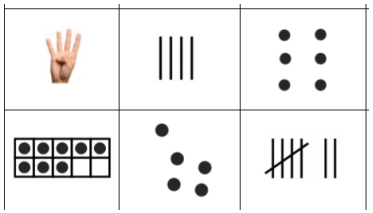
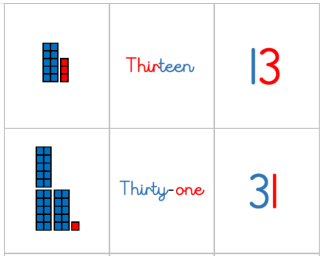
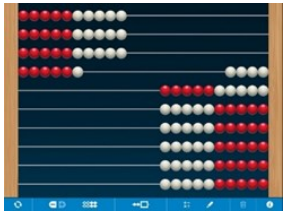
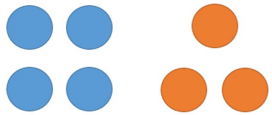
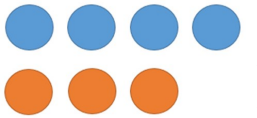
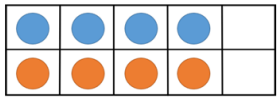
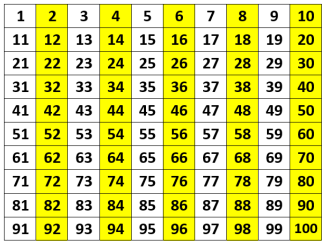
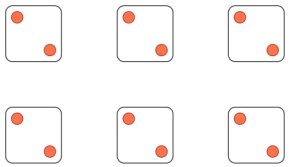
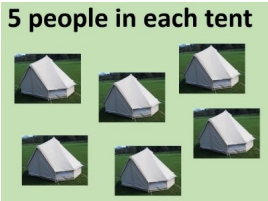
Reception

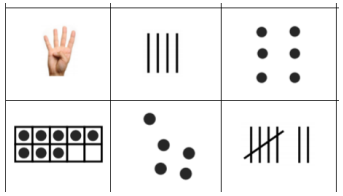
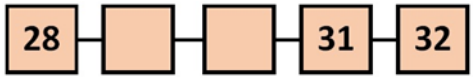
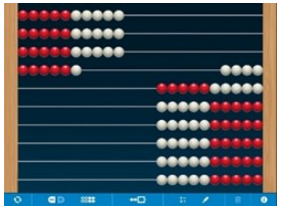
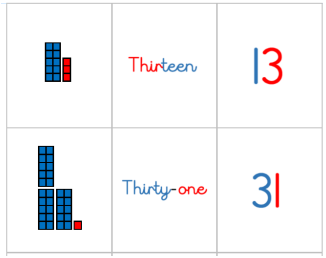
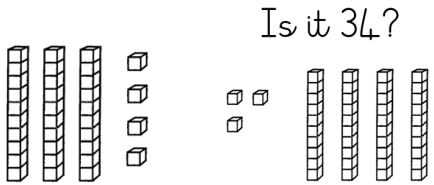
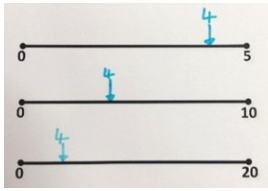
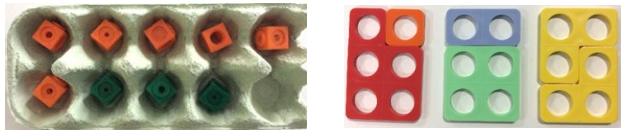
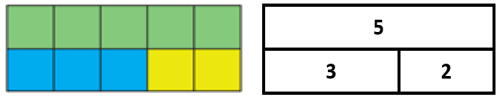
Objective	Visual representations
Count reliably with numbers from 1-20	For 1:1 counting, number sounds are clearly separated and items counted with exaggerated movements. Counted objects are rearranged in regular patterns to support quantity recognition.  Children learn that each object is counted once and the last number is the total for the set— count small sets in irregular arrangements. Progress by counting out items from larger set; objects that can't be moved; make objects not visible once counted; count movements and sounds. Counting on taught by counting two sets, then screening one of the counted sets.   
Identify and use numerals	Children match numerals to different representations of number for quantities 1-10 (see 'knowledge of numbers as quantities') e.g. making and finding 5 in different ways. Children learn that 'teen' represents 10 and match teen/ten visual cards. Place value arrow cards used for partitioning and combining tens and units.  *Different representations matched to numerals*  
Understand 10 as a unit	Items are counted into groups of 10, for example pipe cleaners bundled into 10s or items counted into 10-frames. Children recognise quantities in multiple 10-frames as 'how many tens, how many ones'.   Children count tens/ones on Slavonic Abacus. Coloured 100-square supports counting in tens. 

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

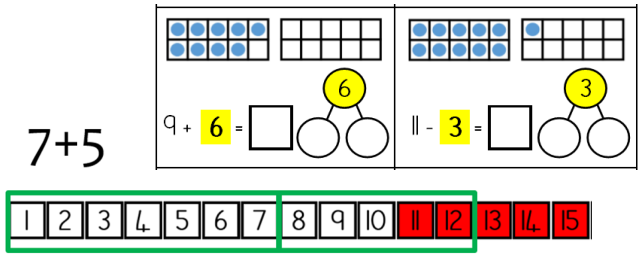
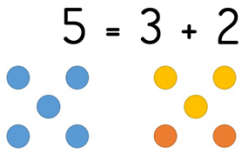
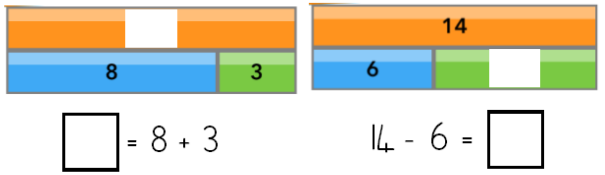
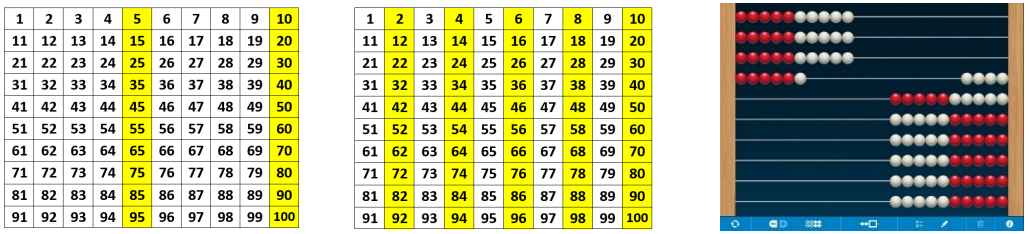
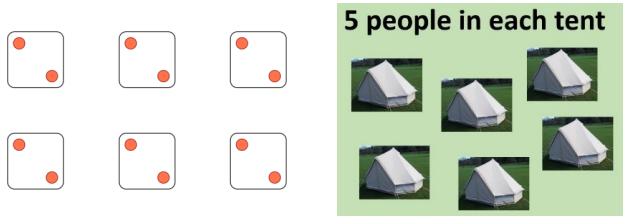
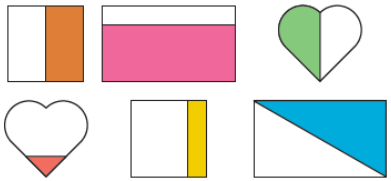
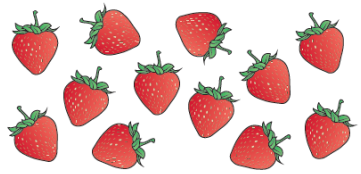
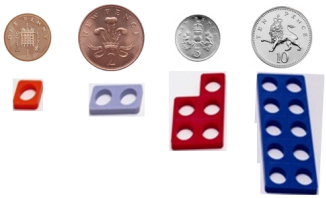
Reception

Objective	Visual representations
Secure knowledge of numbers as quantities	Children instantly subitize 1-3 items through dot pattern games and everyday experiences. Items may be unrelated.  *Image shown briefly. How many toys?* A range of representations used for quantities 1-10. Children show numbers in different ways on fingers; games used to improve finger discrimination. Quick recognition of regular and irregular dot patterns, with larger quantities visualised in two parts (e.g. see 5 as 3 and 2). Children are taught to recognise quantities on 10-frame and base-5 number track. 
To recite forwards and backwards number word sequences	Forwards and backwards number word sequences supported using songs and rhymes. Children continue number sequences starting from different numbers with some prior words in appropriate range e.g. 3, 4, 5, 6… or 24, 23… The transition ofer 10s boundaries supported by visuals. Number tracks used, with numbers hidden to add challenge as appropriate. 
Add and subtract single-digit numbers	Addition built on experience of counting two groups. Opportunities provided for comparing quantities, using language more/less. Combining quantities in 10-frames and using Numicon encourage non-counting-in-ones strategies. Arrangement of sets counted also encourage counting on and calculation strategies.    *Representation of 4+3 encourages counting on from 4*  *Representation of 4+3 to help visualise 3+3+1*
Develop pre-multiplication and division concepts	Halves and doubles identified in a range of contexts, with a focus on equal halves. Shown on 10-frames and with Numicon.  Counting in 2s supported by colouring of 100-square  Opportunities for 'repeat add' counting in context e.g. counting socks. Repeated addition shown with dice patterns. Grouping and sharing context tasks provided.  

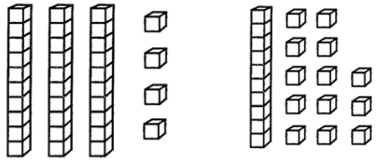
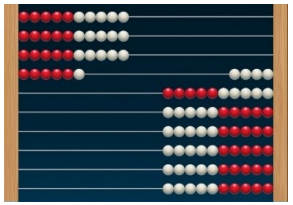
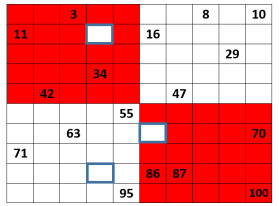
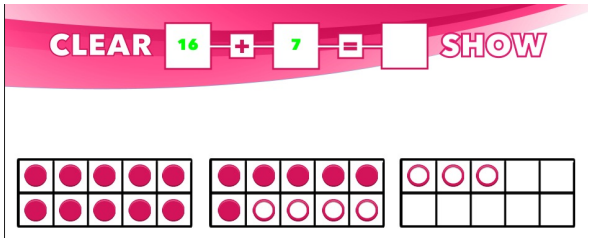
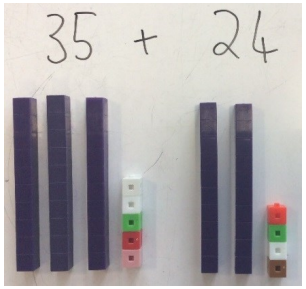
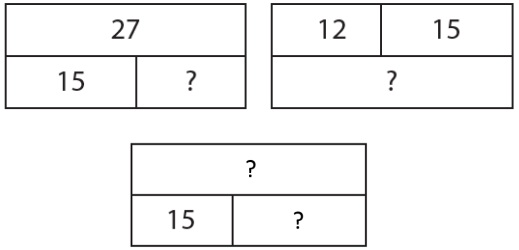
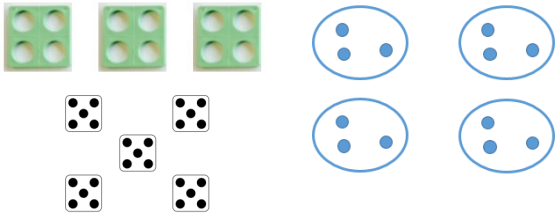
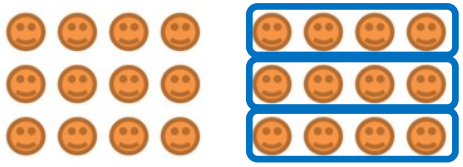
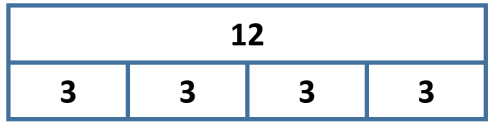
Year 1

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.  Partition 2-digits numbers using place-value cards 
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, dot patterns 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. 

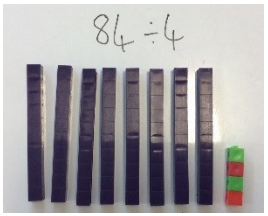
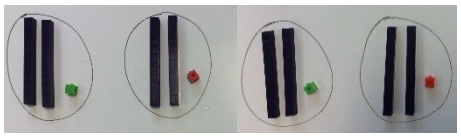
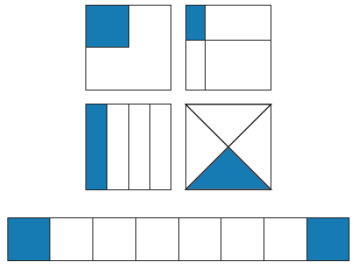
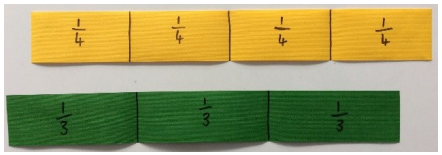
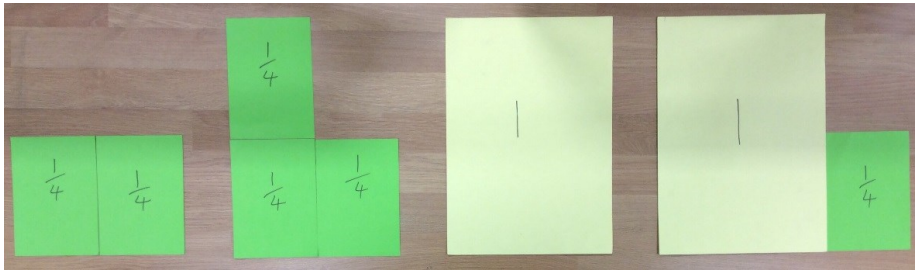
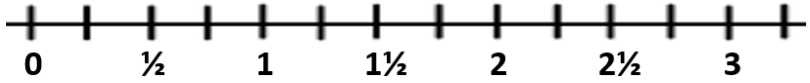
Year 1

Objective	Visual representations
Represent and use number bonds and related subtraction facts within 20	10-frames and 2-colour number tracks show calculations bordering 10: 'how many to 10, how many more?' Lead to use of blank number line.  Equivalence shown with balance scales and dice patterns.  Bar models used to show relationship between addition and subtraction. 
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 visual then 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. 

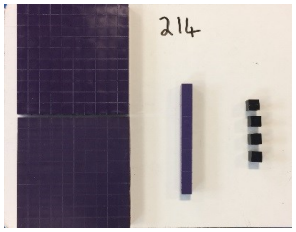
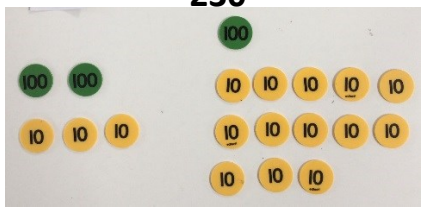
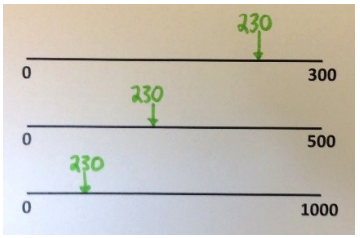
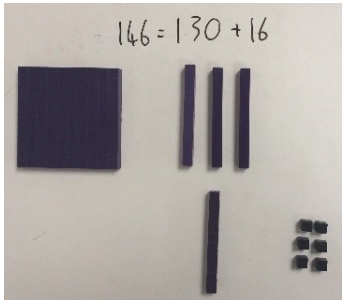
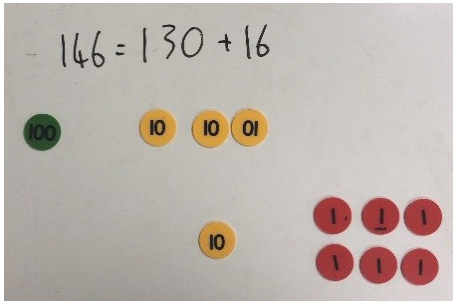
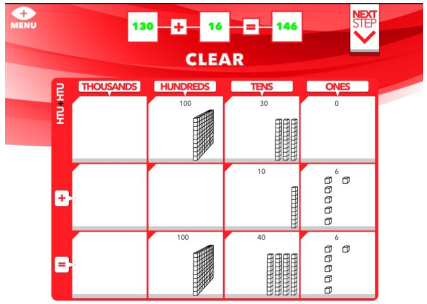
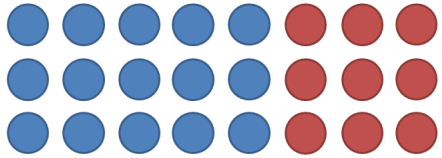
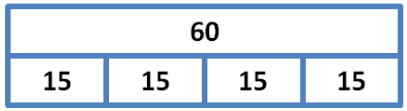
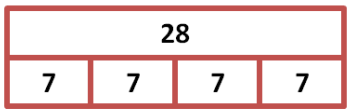
Year 2

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. 
Understand x as repeated adding, find related x and ÷ facts from a number sentence	Numicon and images of repeated quantities show multiplication as repeated addition.  Arrays show commutativity of multiplication. Columns/rows circled to link to division.  Bar model shows relationship between whole/ parts and makes links to division. 

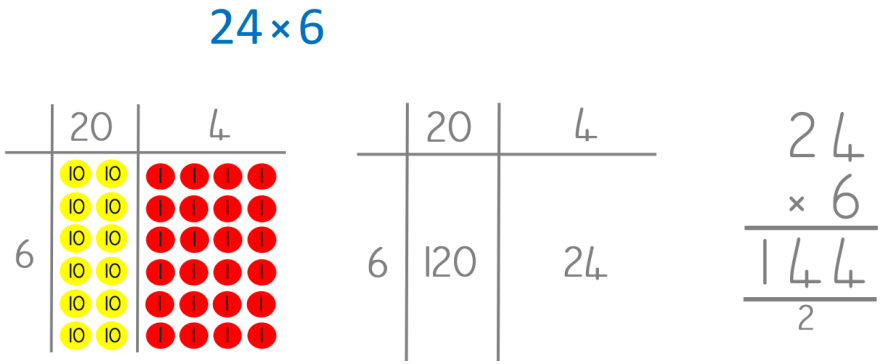
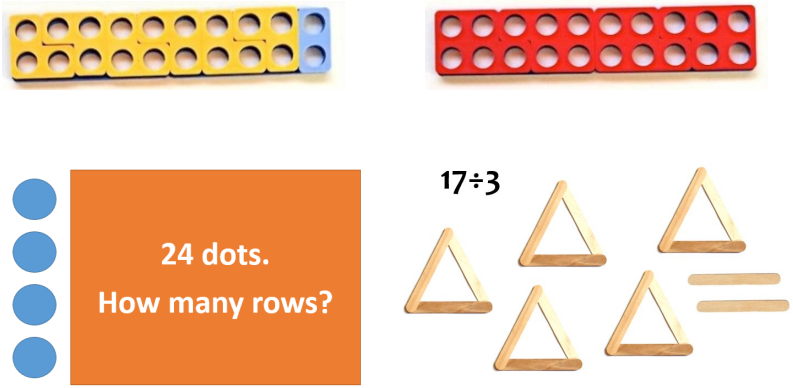
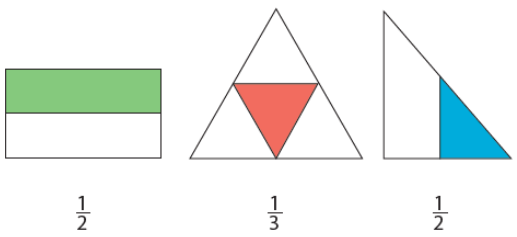
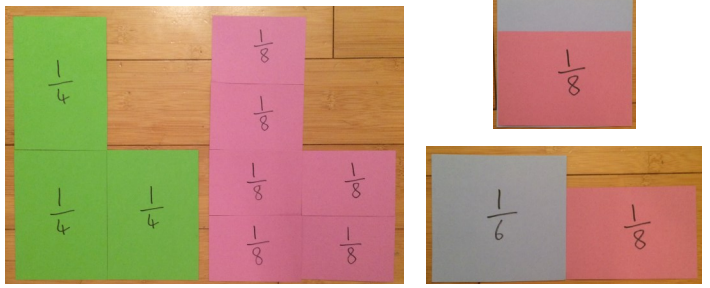
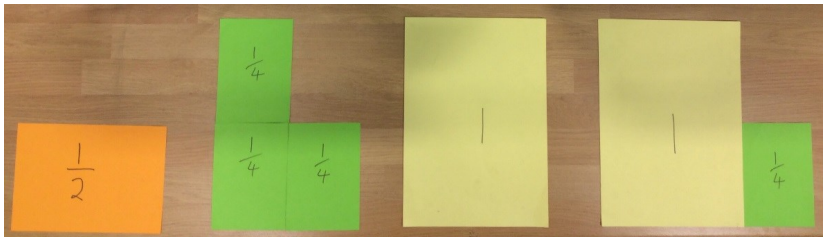
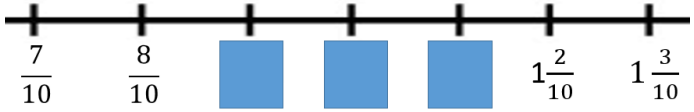
Year 2

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 covered arrays and Numicon: how many [divisors] in [dividend]?  **20 ÷ 5 = 4** **20 dots.** **How many rows?** 	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 ¼ blue?**  *Include fractions of containers*	Fractions of a length/number line: Estimate the position of $\frac{1}{4}$, $\frac{1}{3}$ and $\frac{3}{4}$ 0 1  	Fractions of quantity: **The children can have ¾ of the cupcakes.** 
Use halves and quarters as counting numbers, going over 1	Modelled with fraction cards and on a number line.  	 	

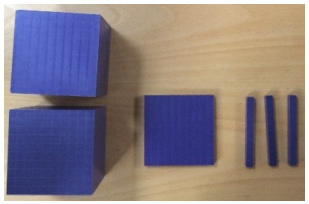
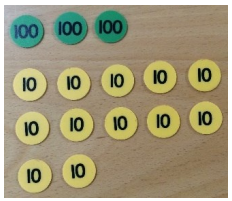
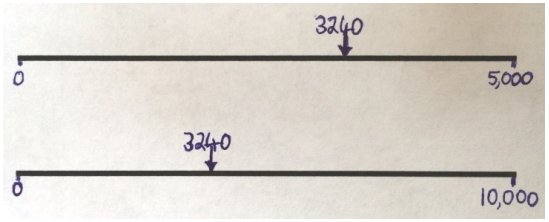
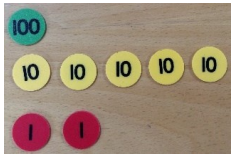
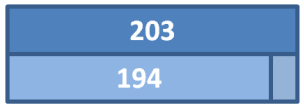
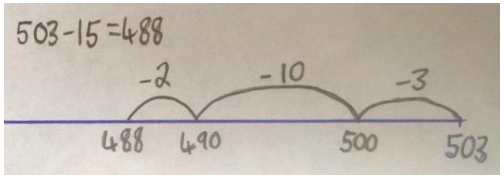
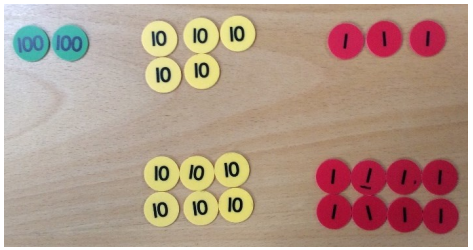
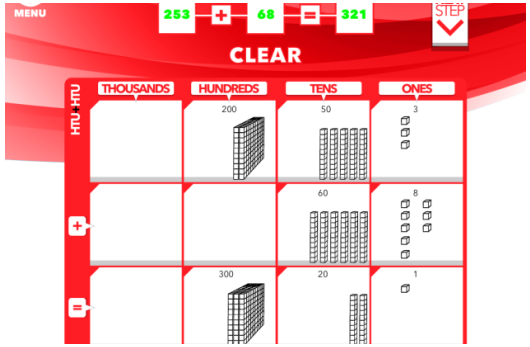
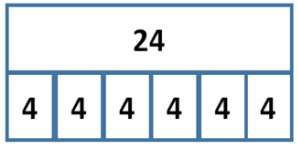
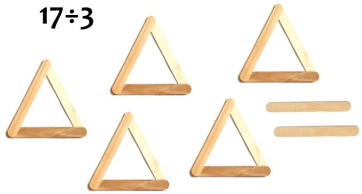
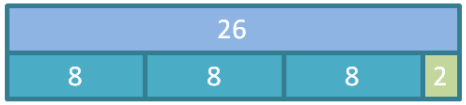
Year 3

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. **230**  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.    **106 – 90 =** 
Understand the inverse relationship between x and ÷; know x as repeated adding, use to derive related multiplication facts.	A range of images show multiplication as repeated addition. 2-colour arrays show distributive law. **8x3**   **5x3 + 3x3**  Bar model shows link between multiplication and division, and model division as sharing and grouping. **60 ÷ 4 = 15**  ***'60 in four equal parts'*** **28 ÷ 7 = 4**  ***'How many 7s in 28?'***

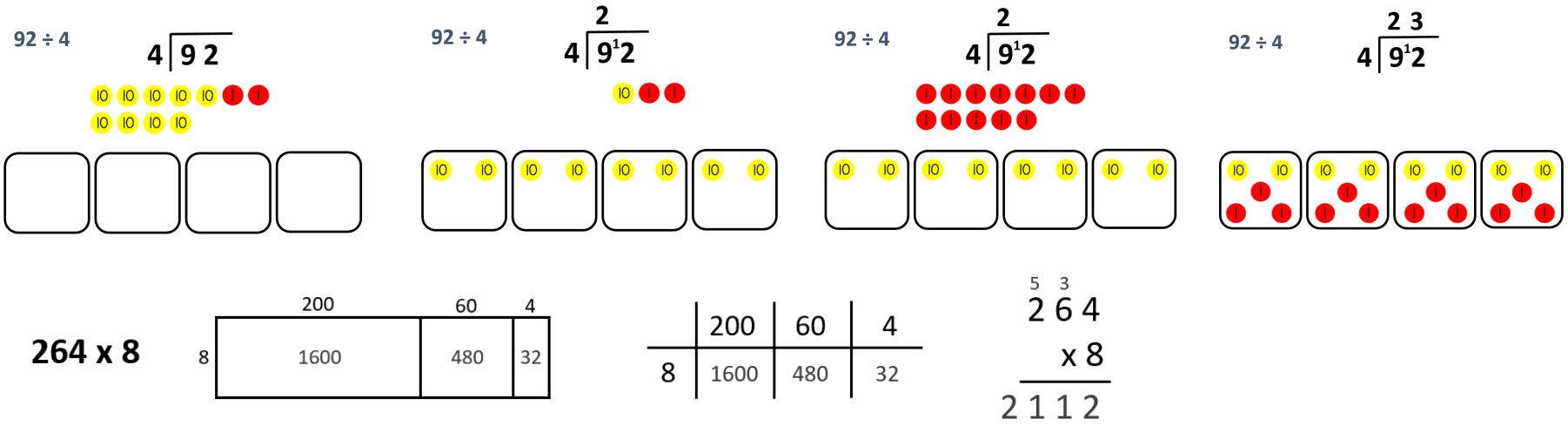
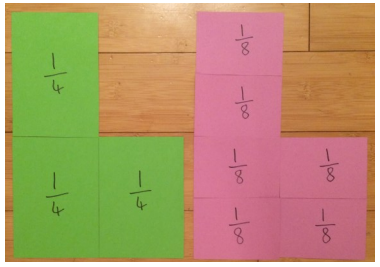
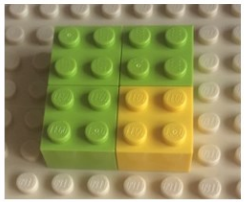
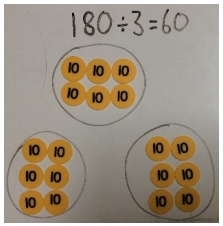
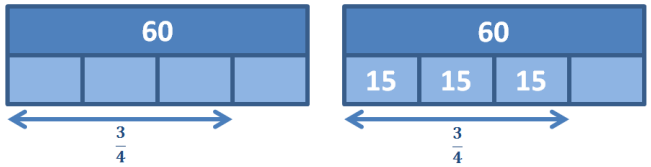
Year 3

Objective	Visual representations
Use efficient formal written methods for multiplication and division	Multiplication modelled using place value coins, leading to efficient written forms:  The concept of 'How many [divisors] in [dividend]' shown using Numicon, part-hidden arrays and by making shapes with matchsticks. **20 ÷ 3 (how many 3s in 20?) and 20 ÷ 5 (how many 5s in 20?):** 
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?**  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.  

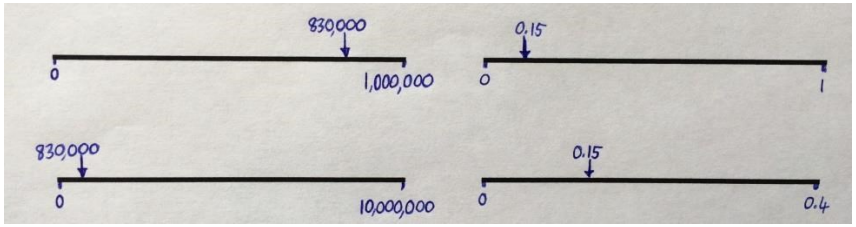
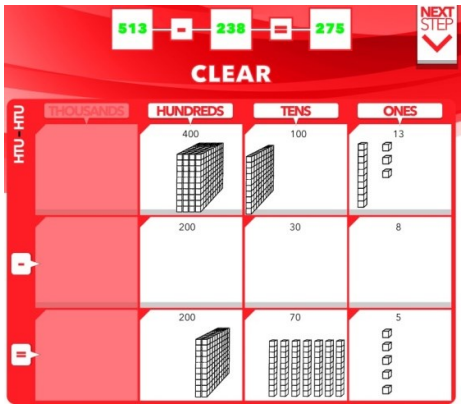
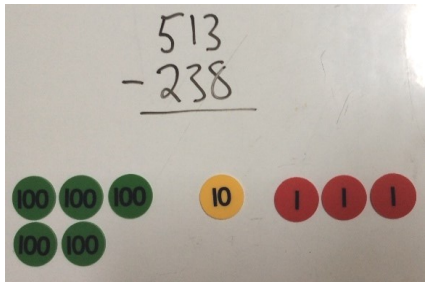
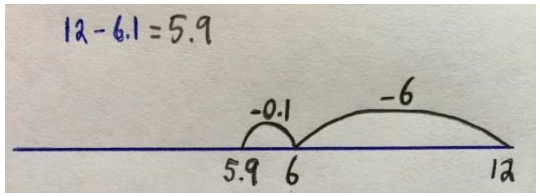
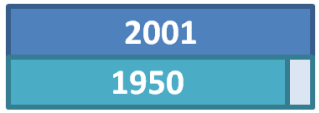
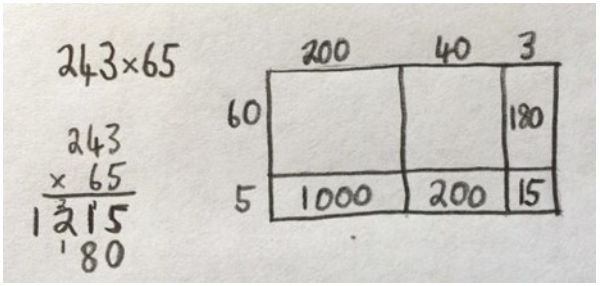
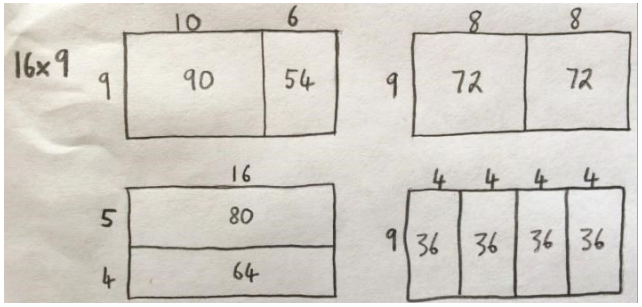
Year 4

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 division as 'how many [divisors] in [dividend]' showing remainders using matchsticks to make shapes and bar models.  

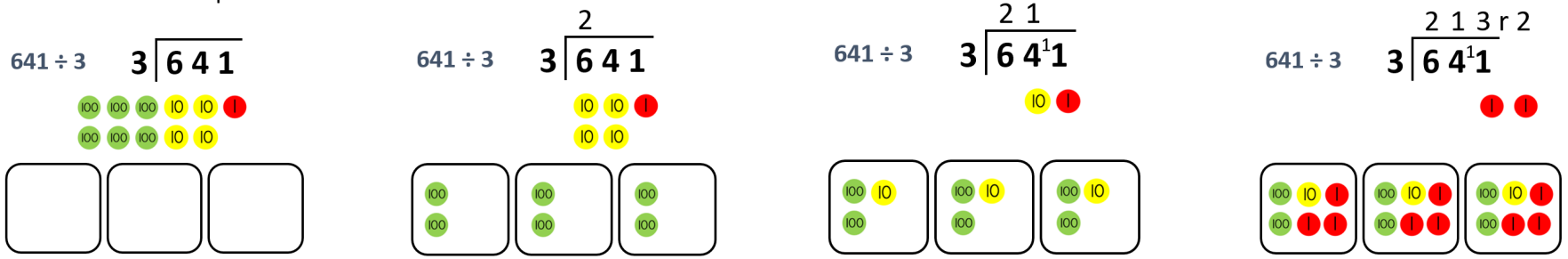
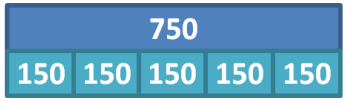
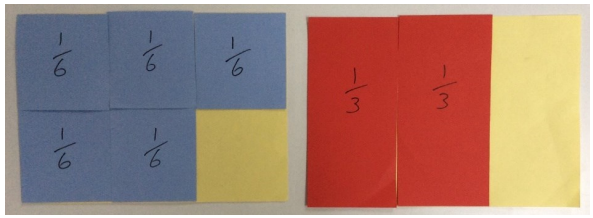
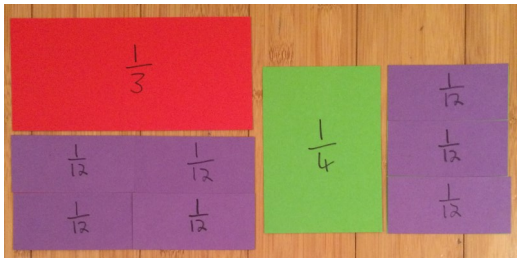
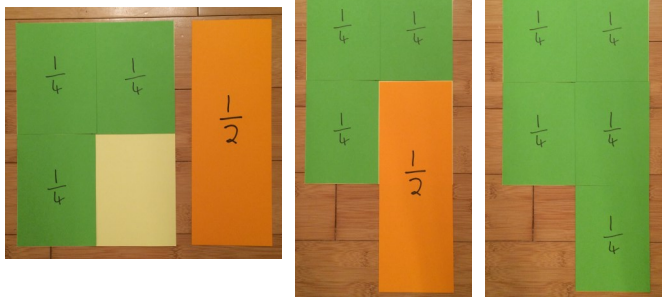
Year 4

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.  **264 x 8** 8 × (200 + 60 + 4): 1600 + 480 + 32 5 3 2 6 4 x 8 2 1 1 2
Find equivalent fractions, calculate fractions of amounts (unit and non-unit fractions)	Fraction cards and Lego used to show equivalence.   $\frac{3}{4} = \frac{12}{16}$ Fractions of quantities shown using place value counters and bar models, presented in stages.  $\frac{3}{4}$ of 60 
Know decimal equivalents for quarters and halves, relating to division	Dividing length of a metre ruler into two/four equal parts. 

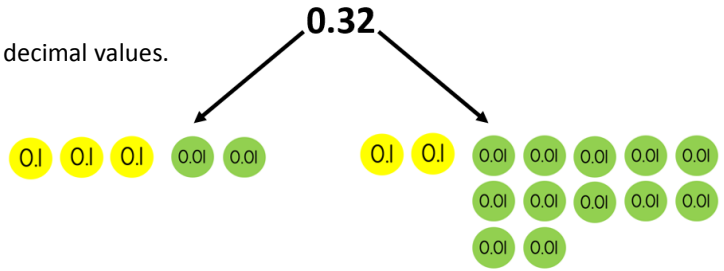
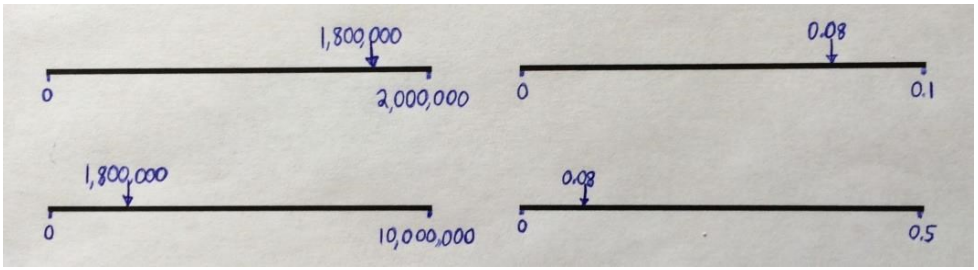
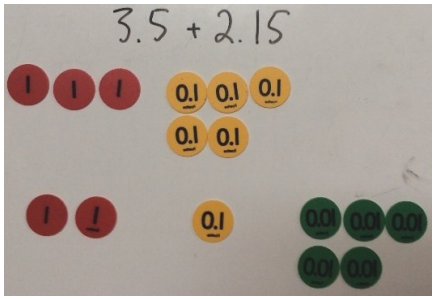
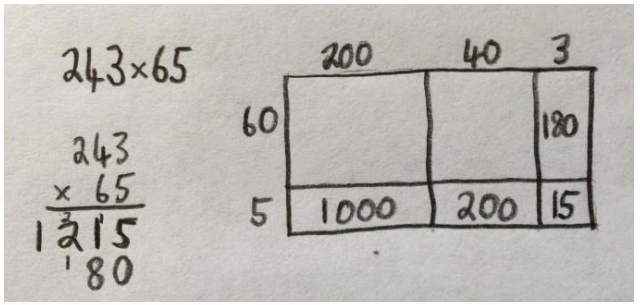
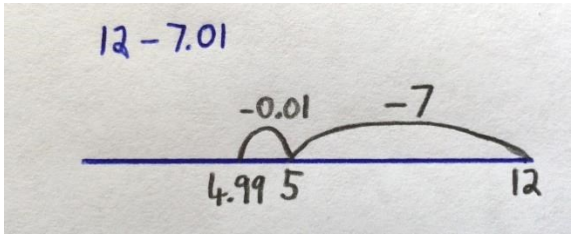
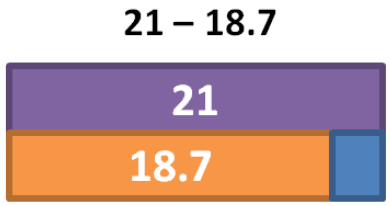
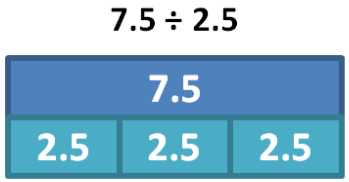
Year 5

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***  Estimate the position of numbers on blank number lines with different start/ end numbers. 
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.   Mental calculation methods modelled using appropriate visual, e.g. rounding and adjusting on a number line, bar model to show subtraction as difference.  **2001 - 1950** 
Develop a range of strategies for multiplication including efficient written methods	Compact written method made visual by area model.  Area model used to show multiplication where numbers are partitioned in different ways. 

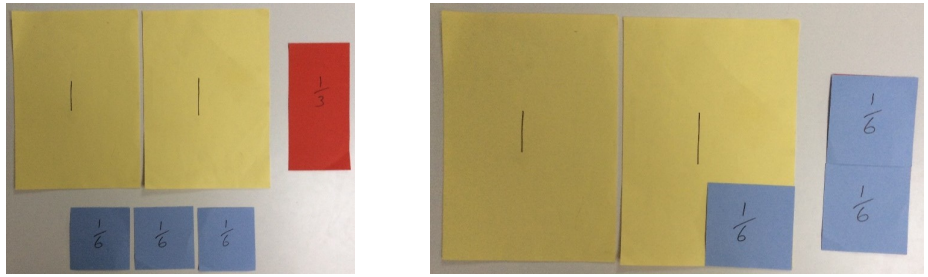
Year 5

Objective	Visual representations
Develop a range of strategies for division including efficient written methods	Division modelled with place value counters.  Bar model used to reinforce 'how many [divisors] in [dividend]?' **750 ÷ 150** 
Compare and order fractions, find equivalent fractions, add and subtract fractions.	Fraction cards used to compare, show equivalence and model calculations.   *Example: ¾ + ½* 
Find decimal equivalents for quarters, fifths and tenths, relating to division	Dividing length of a metre ruler into two/four/five equal parts. 

Year 6

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.  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.  Multiplication visualised using area model. 
Choose efficient strategies and apply flexible knowledge of number to calculate	Choose appropriate visuals to model structure of calculations, including modelling worded questions.   

Year 6

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. 
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.