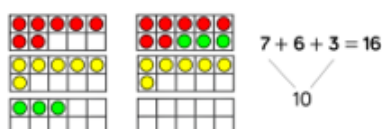
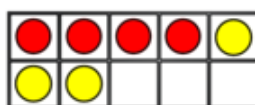
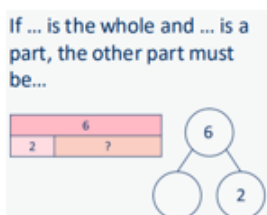


Calculation policy

Addition

Year 1



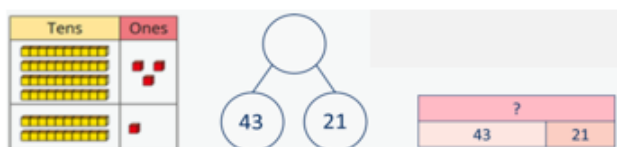
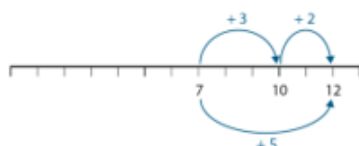
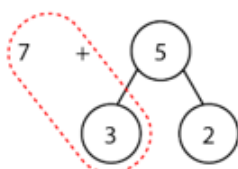
In year 1, children explore numbers to 10 using aggregation and augmentation strategies.

Part-part-whole models, bar models, numicon, and tens frames support aggregation.

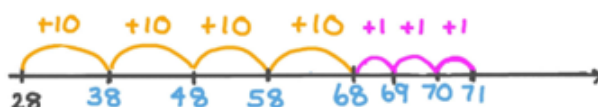
Tens frames and number tracks/lines support augmentation.

Progression to adding 3 one-digit numbers.

Year 1 / 2



$$43 + 21 =$$



Addition crossing the tens boundary.

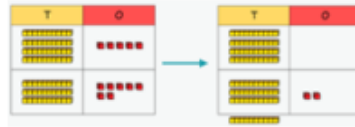
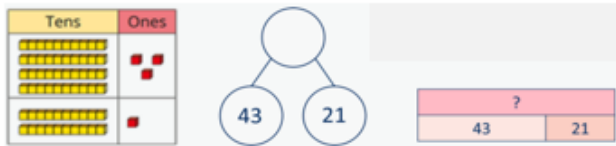
Bridging 10 is introduced using a part-part-whole model and extended to using an number line.

Diennes are used by making both addends and combining. When crossing tens boundary, ten ones are exchanged for one ten.

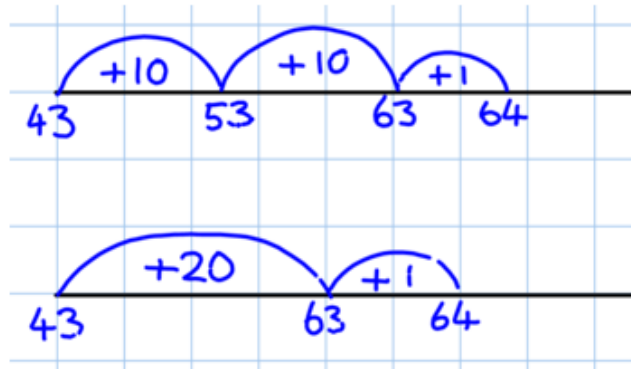
This can be extended to drawing diennes.

Progression in number lines are made by making jumps of 10.

Year 2



$$43 + 21 =$$



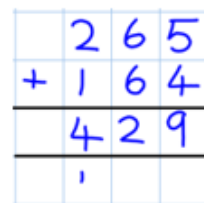
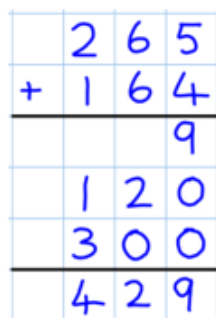
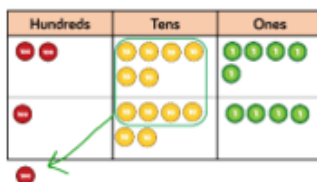
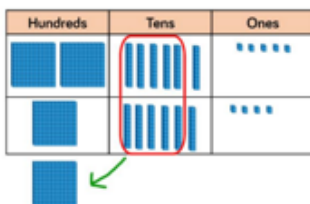
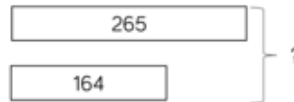
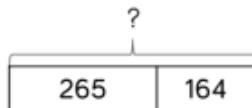
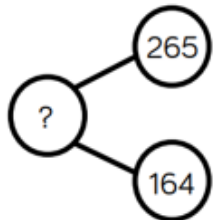
In year 2, children continue to use strategies used in year 1.

Children should apply their knowledge of number bonds to add efficiently.
e.g. $7 + 6 = 13$ so $47 + 6 = 53$

Children continue to use number lines and diennes to support adding larger numbers when approaching and exceeding 100.

Progression in number lines is evident with Tens and Ones remaining combined.

Year 3



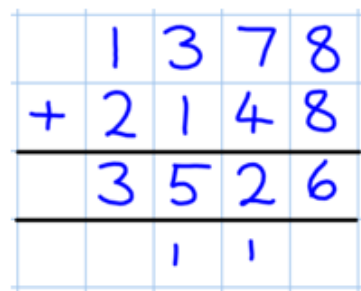
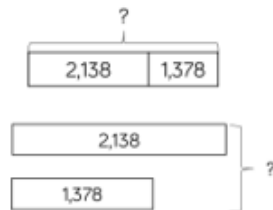
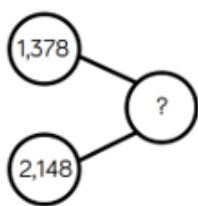
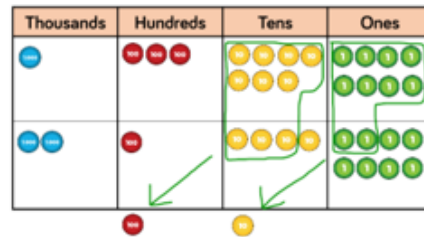
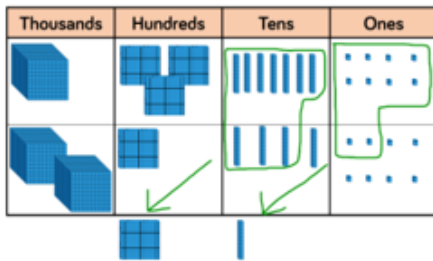
In year 3, children should have a range of manipulatives to support addition.

Diennes and place value counters alongside a place value grid are effective when adding three-digit numbers.

Children are to record using expanded column method alongside manipulatives.

Children to progress to contracted column method after gaining sound understanding of regrouping.

Year 4



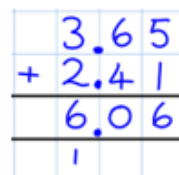
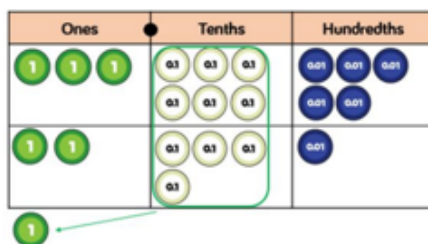
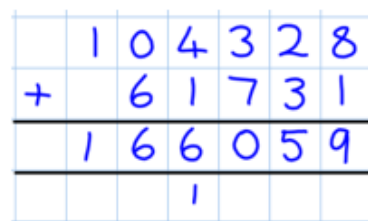
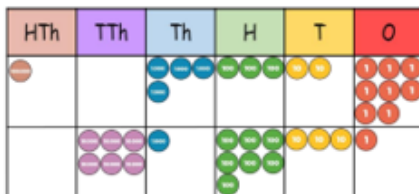
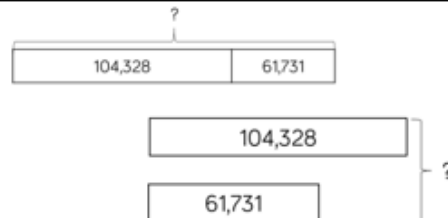
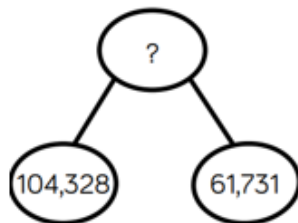
In year 4, children are to use place value counters and diennes to support with adding numbers up to 4-digits.

Children should be recorded number sentences alongside the concrete resources to support with making the links.

Children will continue to use part-whole and bar models.

Children are to use the contracted column method if secure with expanded method taught in year 3.

Year 5/6



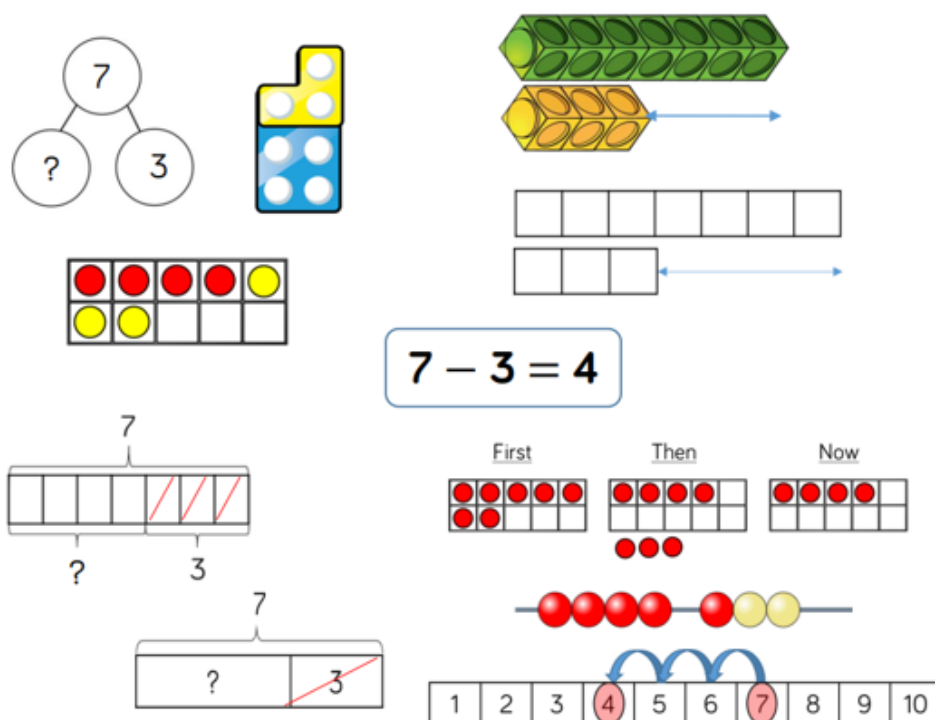
Children in year 6 will continue to use part-whole and bar models to support addition.

Place value counters are to be used to support addition including adding decimals.

At this stage, children should be encouraged to use the contracted column method to add large numbers efficiently. This includes decimals, and applying this to contexts such as money.

Subtraction

Year 1

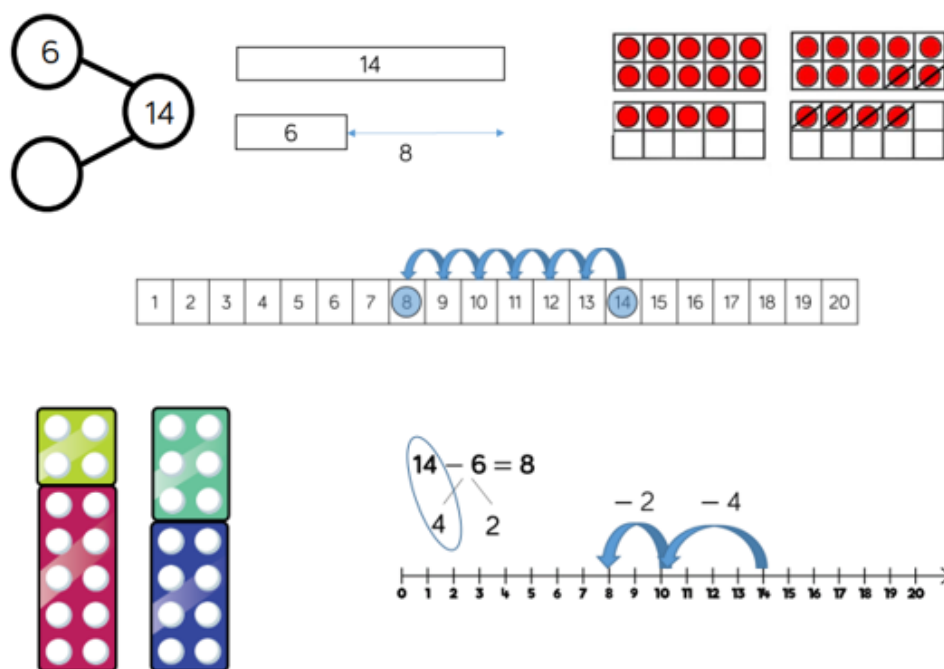


In year 1, children explore numbers to 10 using reduction and finding the difference strategies.

Manipulatives like numicon, tens frames, and multi-link are used to support understanding with reduction and finding the difference.

Bar models demonstrate finding the difference.

Year 1 / 2

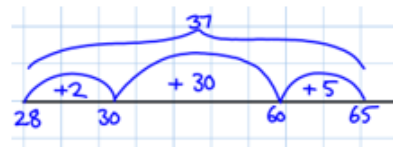
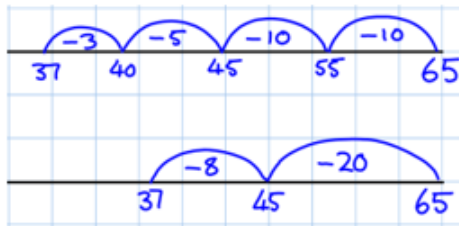
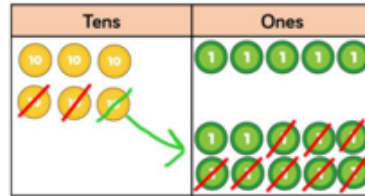
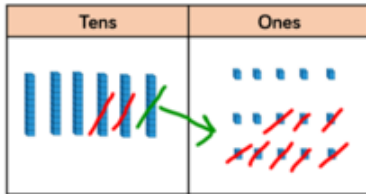
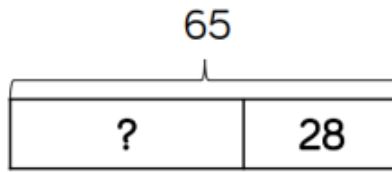
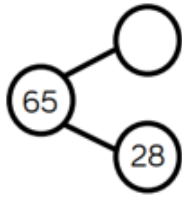


Subtracting across tens boundaries.

In year 1, this is done by counting backwards using manipulatives such as tens frames and number tracks to support.

This progresses to children being encouraged to find the number bond to the ten when partitioning the subtracted number. $14 - 6$ (-4 then -2) = 8

Year 2



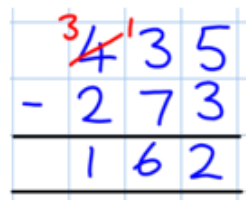
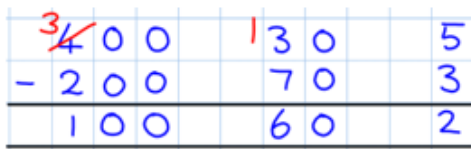
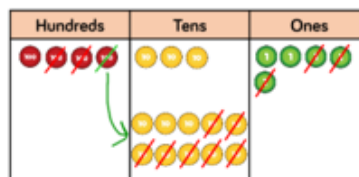
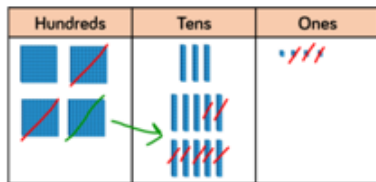
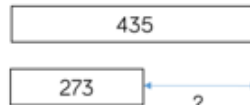
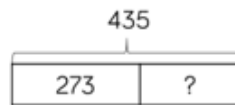
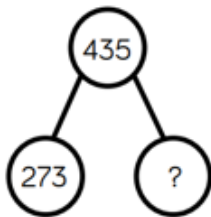
In year 2, children continue with counting backwards to find the difference.

Diennes and place value counters are useful to use along part-part-whole models and bar models.

Children can progress to using number lines. Encourage jumps of 10 to become more efficient.

Number lines can also be used to count forwards to make links with the inverse operation.

Year 3



In year 3, children subtract numbers with up to 3 digits.

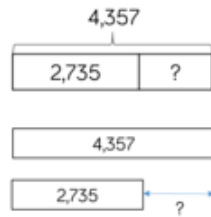
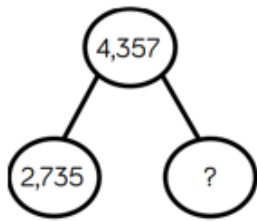
Diennes and place value counters are an effective manipulative to support with this. The calculation should be present alongside the manipulatives so that children make links.

Children should be taught strategies that do not cross boundaries first.

Children should be taught exchanging using these manipulatives.

Children should continue using manipulatives alongside written formal methods.

Year 4

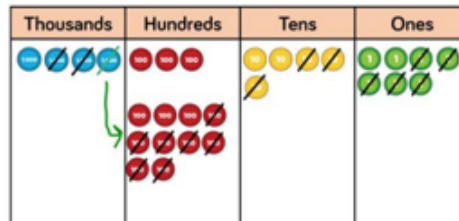
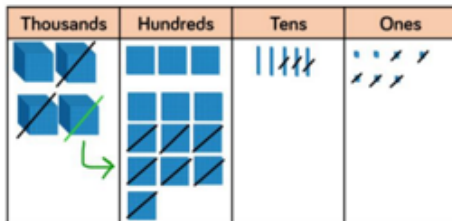


$$\begin{array}{r} 4357 \\ - 2735 \\ \hline 1622 \end{array}$$

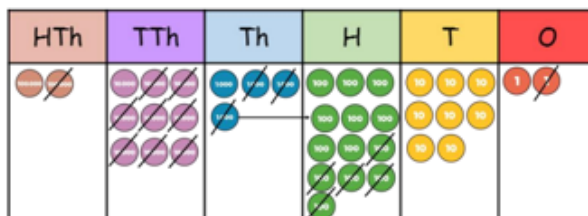
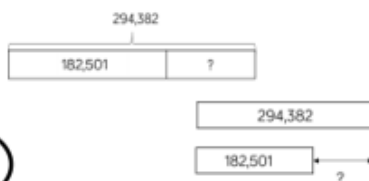
In year 4, children subtract numbers with up to 4 digits.

Part-part-whole models and bar models should be used to visualise these calculations.

Diennes and place value counters are to be used alongside written formal methods.



Year 5 / 6



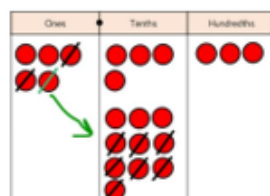
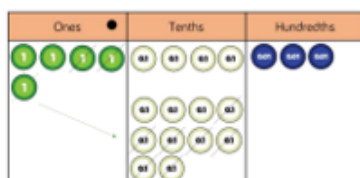
	2	9	3	1	8	2
-	1	8	2	5	0	1
	1	1	1	8	8	1

In year 5 and 6, children will subtract numbers with 6 digits and up to three decimal places.

Children should be encouraged to work in the abstract using formal written methods.

This includes subtracting with decimals up to thousandths.

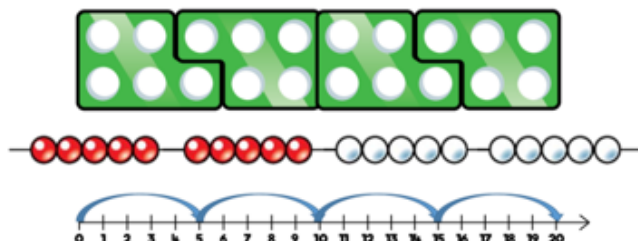
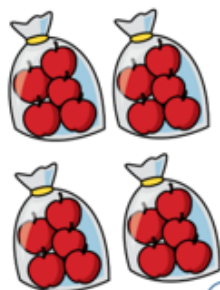
Children should also experience subtracting decimals in the context of money and other measures.



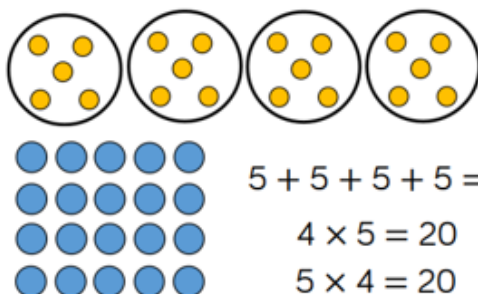
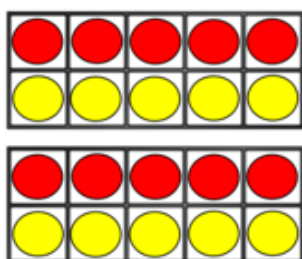
$$\begin{array}{r} 5.43 \\ - 2.70 \\ \hline 2.73 \end{array}$$

Multiplication

Year 1 / 2



One bag holds 5 apples.
How many apples do 4 bags hold?



$$5 + 5 + 5 + 5 = 20$$

$$4 \times 5 = 20$$

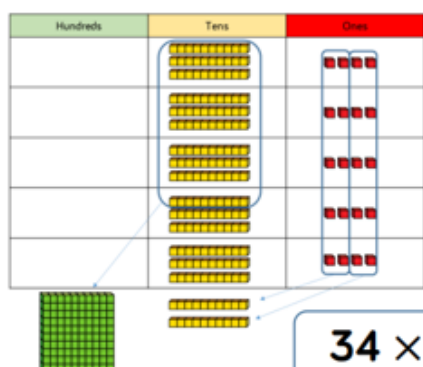
$$5 \times 4 = 20$$

In year 1 and 2, children will need to be familiar with skip counting forwards and backwards in 2s, 5s, 10s, and 3s. Children should look for patterns in these sequences.

Children should demonstrate multiplication as repeated addition. Using numicon, number strings, peg boards (arrays) and pictorial representations, such as number lines and groups of, to solve.

In year 2, children are introduced to the multiplication symbol.

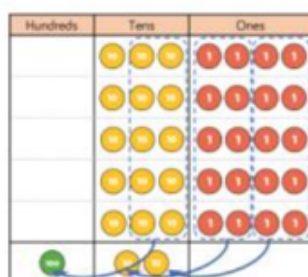
Year 3



$$34 \times 5 = 170$$

	H	T	O	
		3	4	
x			5	
		2	0	(5 x 4)
+	1	5	0	(5 x 30)
	1	7	0	

	H	T	O
		3	4
x			5
	1	7	0



In year 3, children should be familiar with 2, 3, 4, 5, 8, 10 times tables.

Children will learn expanded and contracted methods of multiplication to multiply a 2 digit number by a 1 digit number.

Diennes and place value counters should be used alongside calculations.

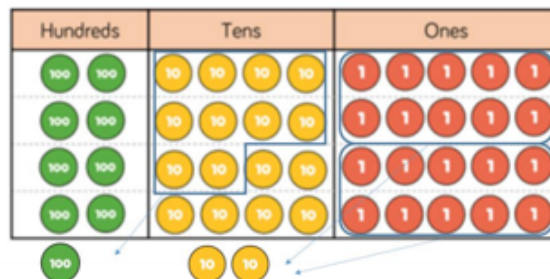
Children should progress to using their times table knowledge to support with working in the abstract.

Year 4



$$245 \times 4 = 980$$

	H	T	O
	2	4	5
x			4
	9	8	0
	1	2	



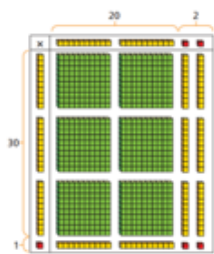
In year 3, children should be familiar with times tables up to 12×12 .

Children should continue to use diennes and place value counters to support multiplication calculations.

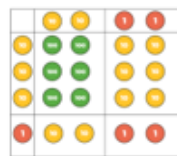
Children should be encouraged to record using a contracted column method.

When multiplying larger numbers, children can use multiplication grids to support to ensure focus is upon the use of written method.

Year 5 / 6

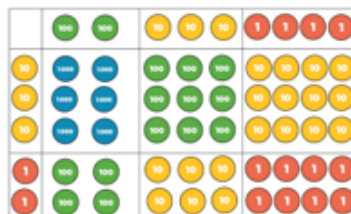


$$22 \times 31 = 682$$



x	20	2
30	600	60
1	20	2

	H	T	O
		2	2
x		3	1
		2	2
	6	6	0
	6	8	2



$$234 \times 32 = 7,488$$

x	200	30	4
30	6,000	900	120
2	400	60	8

In years 5 and 6 children will multiply multi digit numbers by 2 digits.

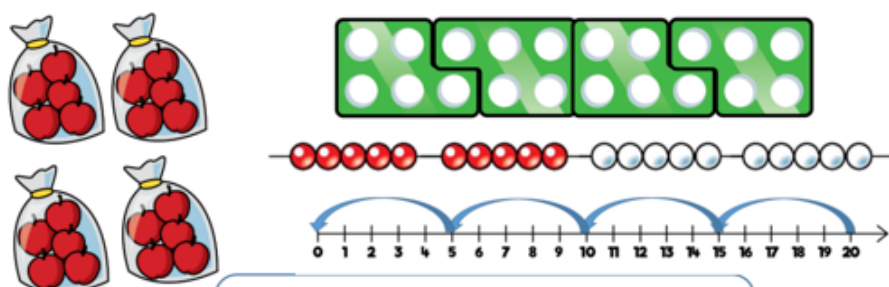
Children are to use area/grid models with diennes or place value counters to support with understanding of the size of the numbers they are using. This can then be completed mentally.

Children should progress to using a column method alongside the area/grid model to identify links.

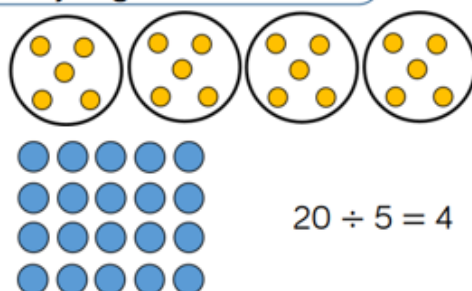
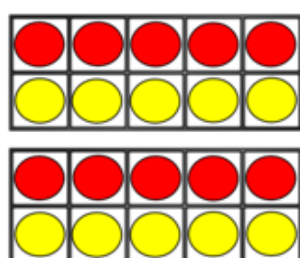
Multiplication grids can be used to support with times tables.

Division

Year 1 / 2



There are 20 apples altogether.
They are put in bags of 5.
How many bags are there?



$$20 \div 5 = 4$$

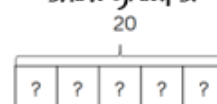
In year 1 and 2, children solve division questions by grouping and counting the numbers of groups.

This supports links with multiplication and repeated addition.

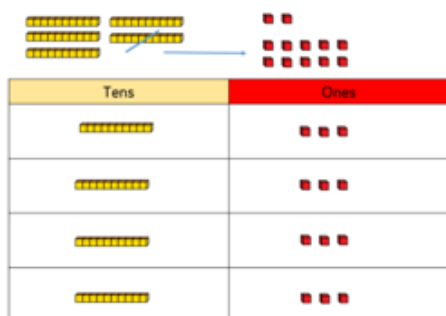
Children should use numicon, tens frames, peg boards (arrays) and counters to create groups.

This is extended to written methods such as number lines and pictorial drawings.

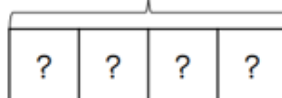
Bar models are also used to show groups.



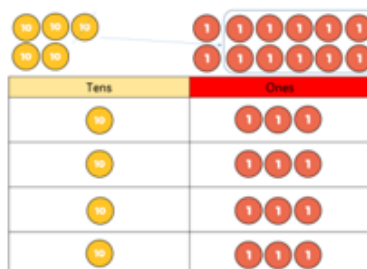
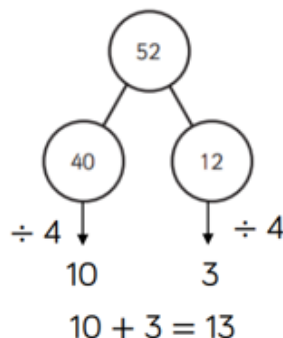
Year 3 / 4



52



$$52 \div 4 = 13$$



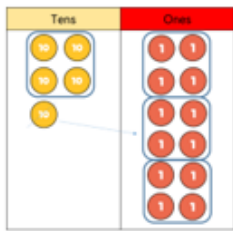
In year 3, children should begin with division questions that do not require exchanging.

Diennes and place value counters support division by sharing into groups beginning with the dividend starting outside of the grid.

Part-part-whole models allow children to partition into easier to divide numbers.

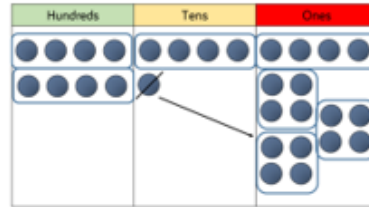
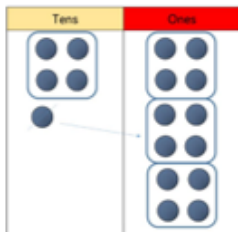
When introduced to remainders, manipulatives are left outside of the grid once equal groups have been made.

Year 5



$$52 \div 4 = 13$$

		1	3
4	5	1	2



$$856 \div 4 = 214$$



		2	1	4
4	8	5	1	6

In year 5, children should continue their understanding of grouping methods using diennes and place value counters.

This can also be used in a pictorial method by drawing.

Children should then learn short division while using manipulatives to support and make links.

Calculations with greater number of exchanges will require written short division.

Year 6

		0	3	6
12	4	4	3	7

$$432 \div 12 = 36$$

$$7,335 \div 15 = 489$$

		0	4	8	9
15	7	3	3	5	

15	30	45	60	75	90	105	120	135	150
----	----	----	----	----	----	-----	-----	-----	-----

$$7,335 \div 15 = 489$$

	0	4	8	9
15	7	3	3	5
-	6	0	0	0
	1	3	3	5
-	1	2	0	0
		1	3	5
-		1	3	5
				0

$$\begin{aligned} 1 \times 15 &= 15 \\ 2 \times 15 &= 30 \\ 3 \times 15 &= 45 \\ 4 \times 15 &= 60 \\ 5 \times 15 &= 75 \\ 10 \times 15 &= 150 \end{aligned}$$

$$372 \div 15 = 24 \text{ r}12$$

		2	4	r	1	2
1	5	3	7	2		
-		3	0	0		
			7	2		
-			6	0		
				1	2	

$$\begin{aligned} 1 \times 15 &= 15 \\ 2 \times 15 &= 30 \\ 3 \times 15 &= 45 \\ 4 \times 15 &= 60 \\ 5 \times 15 &= 75 \\ 10 \times 15 &= 150 \end{aligned}$$

		2	4	4
1	5	3	7	2
-		3	0	0
			7	2
-			6	0
				1

In year 6, children will continue with short division. When the divisor is 2 digit, the child may need to record skip counting to support.

Long division will also be taught. Children may need to write out multiples to support with larger numbers.

When a remainder is left at the end of the calculation, children can leave it as a remainder of convert to a fraction depending on context.

