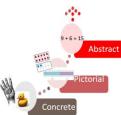




Addition	Concrete	Pictorial	Abstract
Foundation	Use cubes to add two numbers together as a group or in a bar. Simple word problems using their fingers. 5+1=6	Make a record in pictures, words or symbols of addition activities already carried out. Use pictures to add two numbers together as a group or in a bar. **Together as a group or in a bar.** **Together as a group or in a	Children will engage in a wide variety of songs, games and activities. They will begin to relate addition to combining two groups of objects, first by counting all of them and then from counting on from the largest number. Using quantities and objects children add two single digit numbers. Children may be introduced to written 'number sentence' e.g. 4 + 3 = 7 Construct number sentences to go with practical activities.





Year 1	Use part-part whole model. Use cubes to add two numbers together as a group or in a bar. Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.	Use pictures to add two numbers together as a group or in a bar. 8 1 Initially use a number track to count on for addition, counting on from the largest number:	Children will continue to practice counting on from any number e.g. 'Put five in your head and count on four.' Using the part-part whole diagram to move into the abstract
Year 2	Model using dienes, place value counters and numicon Regrouping to make 10. 6 + 5 = 11	8 + 7 = 15 'Put your finger on number eight and count on seven.' Counting on in ones and tens using an empty number line, within 100 28 + 5 = 33 28 + 5 = 33 28 + 30 = 58 28 38 48 58 Also using Bar Model	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
	Start with the bigger number and use the smaller number to make 10.	7 + 3 = 10	23 + 25 = 48 Number line approach may also be modelled to children as another approach to addition.





			Concrete
Year 3	Add together the ones first, then the tens. Tens Units 45 34 7 9 Calculations 21+42= 21 42 Wove to using place value counters	Further develop the use of the empty number line with calculations that bridge 100: $78 + 46 = 124$ $+40$ $+6$ 78 118 124 Introduce column method $63 + 32 = 95$ $60 + 3$ $+ 30 + 2$ $90 + 5 = 95$	223 +114 337 Add the ones first, then the tens, then the hundreds.
Year 4	Continue to use dienes or Place Value counters for adding, exchanging ten ones for a ten and ten tens for a hundred and ten hundreds for a thousand. Hundreds Tens Ones	7 1 5 1 Draw representations using pv grid.	Further develop the formal written method of addition, with three-digit numbers. Revisit the expanded method first, if necessary. $176 + 147 = 323$ 176 $+ \frac{147}{13} (6 + 7)$ $110 (70 + 40)$ $\underline{200} (100 + 100)$ $\underline{323}$





			This will lead into the formal written method. 1845 + 526 = 2371 1845
Year 5	Use Year 4 method if appropriate	Use Year 4 method if appropriate	Continue to teach the use of empty number lines with larger numbers (and decimals), as appropriate.
			Continue to develop the formal written method for addition with larger numbers (and decimal numbers) and with the addition of three or more numbers.
			£154.75 + £233.82 = £388.57
			154·75 + <u>233·82</u> 388·57
Year 6	Use Year 4 method if appropriate	Use Year 4 method if appropriate	Our aim is that by the end of Y6, children use mental methods (with jottings) when appropriate, but for calculations that they cannot do in their heads, they use an efficient formal written method accurately and with confidence.

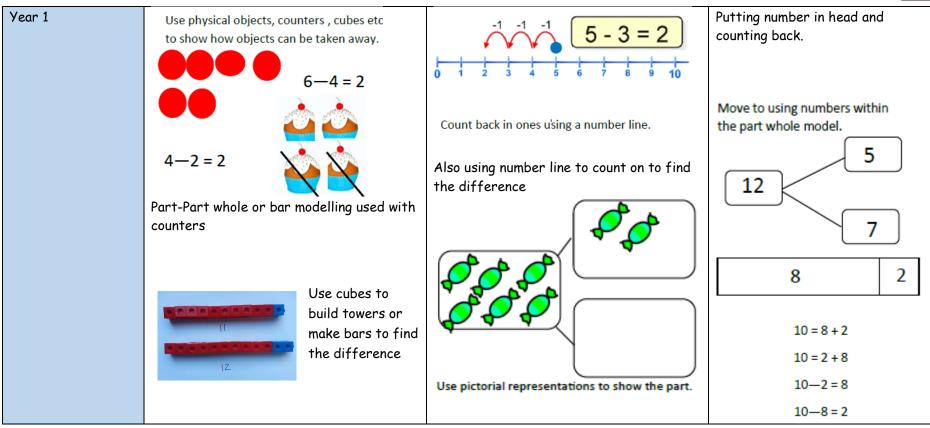




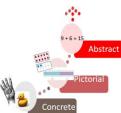
Subtraction	Concrete	Pictorial	Abstract
Foundation	Use physical objects, counters, cubes etc to show how objects can be taken away. 6-4 = 2 Part-Part whole or bar modelling used with counters Solve simple word problems using their fingers 5-1 = 4	Children draw representations of the objects. Including part-part whole or bar model. 5 - 1 = 4	Children will engage in a wide variety of songs, games and activities Using quantities and objects children subtract two single digit numbers. Children may be introduced to written 'number sentence' e.g. 7 - 3 = 4

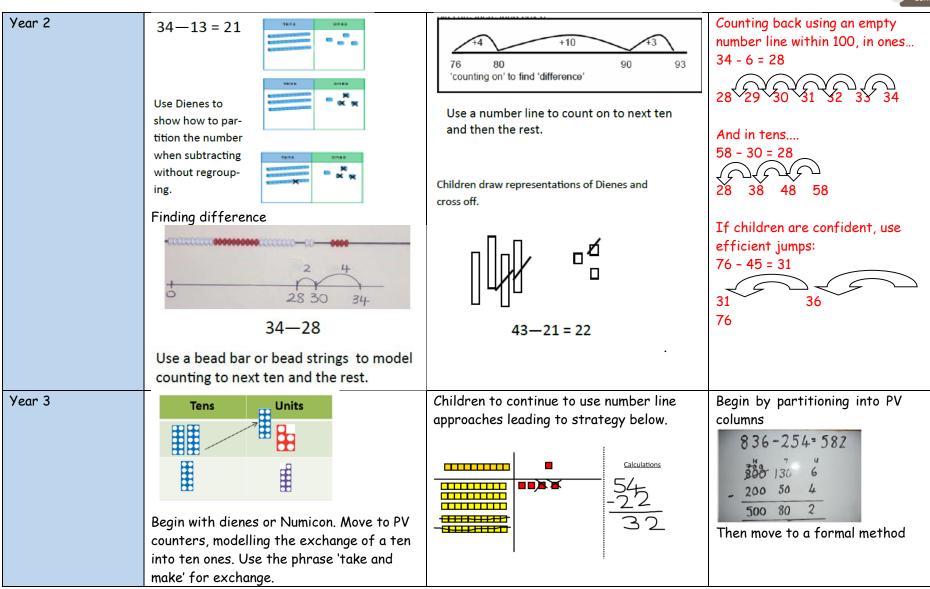
















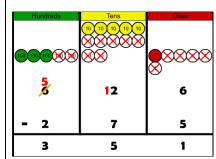
Year 4	234 - 179 O O O O O O O O O O O O O O O O O O	Draw the Base 10 or place value counters alongside the written calculation to help to show working. Calculations 542	Continue to develop the formal written method for subtraction with three and four digit numbers, returning to an expanded method and using base ten materials, if necessary. Move onto larger numbers 3625 - 1219 = 2406
	Numicon, base ten and then move to PV counters.	Calculations 176 - 64 = 176 - 64 112	- <u>1219</u> 2406





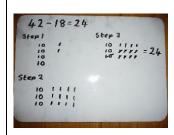
Year 5-6

Show children how the concrete method links to the written method alongside your working. Cross out the numbers when exchanging and show where we write our new amount.



Draw the counters onto a place value grid and show what you have taken away by crossing the counters out as well as clearly showing the exchanges you make.

the



exchange/regrouping.

When
confident,
children can
find their own
way to record

+
Ensure
line up.

Continue to teach the use of empty number lines with larger numbers (and decimals), as appropriate.

Continue to develop the formal written method for addition with larger numbers (and decimal numbers) and with the addition of three or more numbers.

£154.75 + £233.82 = £388.57

154·75 + <u>233·82</u> <u>388·57</u> 1

Ensure that the decimal points line up.





Multiplication	Concrete	Pictorial	Abstract
Foundation	Children to use counters and through song, begin to count in a given multiple.	Children draw visual representations of maths problems involving repeated addition and doubling.	Children shown multiplication number sentence alongside visual representation.
	Part -part whole used with counters Begin to use resources to count in repeated groups of the same size: count in twos; fives; tens	J. T.	Children explore different objects to make doubles- dice, spots on ladybirds. Children shown abstract 'number sentence' alongside visual representation.
			Children are able to chant in twos, fives and tens
Year 1	In practical activities and through discussion they will begin to solve problems involving doubling.		Write addition sentences to describe objects and pictures.
	Three apples for me and three apples for you. How many apples altogether?	3 + 3 + 3	2+2+2+2=10
			Use pictorial including number lines to solve problems
		Use different objects to add	I have 2 toys in a box. How many toys





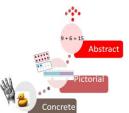
			Concrete
	Children arrange counters for them to use to count in multiples.	equal groups	would I have if I had 5 boxes altogether?
Year 2	Create arrays using counters and cubes and Numicon. Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication	Use representations of arrays to show different calculations and explore commutatively. 4 x 3 or 3x 4 Using Bar model approach to show missing number problems. 4 x = 20	$12 = 3 \times 4$ $12 = 4 \times 3$ Use an array to write multiplication sentences as well as a number line to reinforce repeated addition 00000 00000 $5 + 5 + 5 = 15$ $3 + 3 + 3 + 3 + 3 + 3 = 15$ $5 \times 3 = 15$ $3 \times 5 = 15$

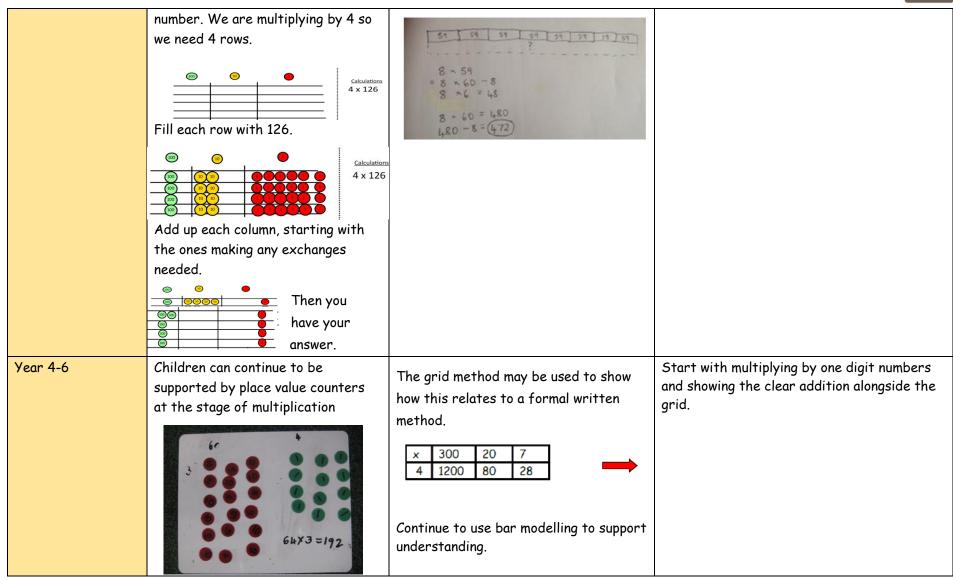




			Concrete
	does not affect the answer.		
Year 3	Show the link with arrays to first introduce the grid method. 4 rows of 10	Children can represent their work with place value counters. E.g. Counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.	Start with multiplying by one digit numbers and showing the clear addition alongside the grid.
	4 rows of 3 Move on to using Base 10 to move towards a more compact method. 4 rows of 13	The grid method may be used to show how this relates to a formal written method.	1200 1308 This may lead to a compact method.
	Move on to place value counters to show how we are finding groups of a	x 300 20 7 4 1200 80 28 Bar Modelling to support children with problem solving.	

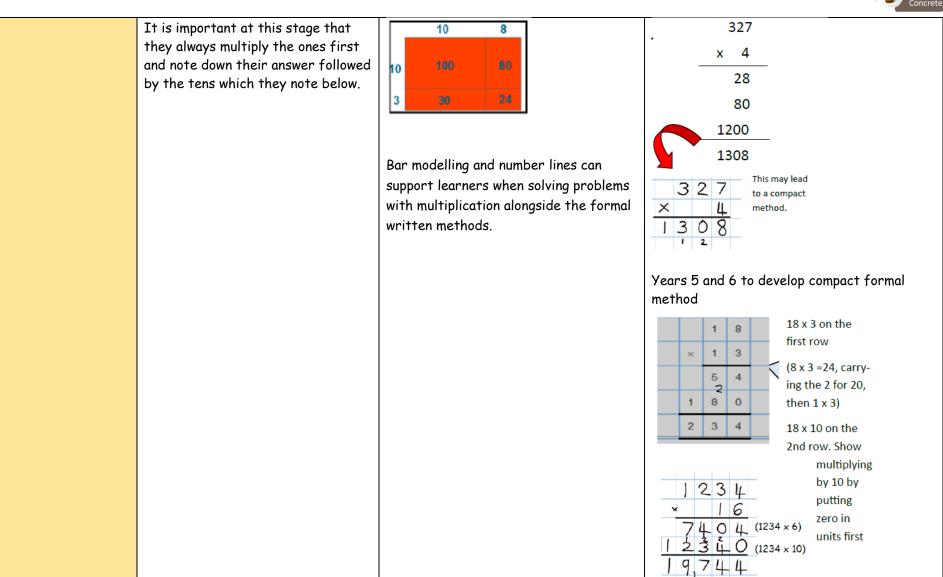










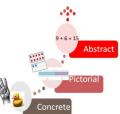


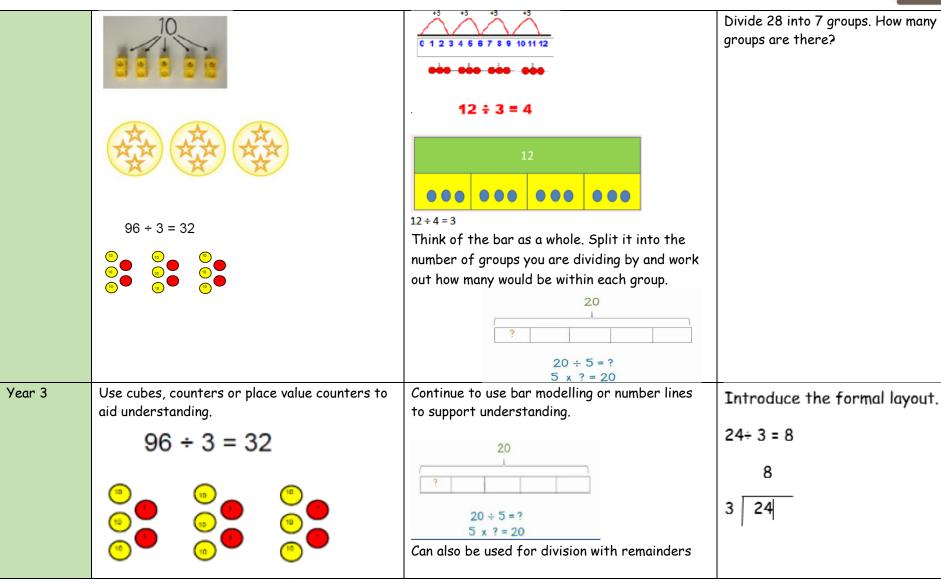




Division	Concrete	Pictorial	Abstract
Year 1/EYFS	Children will share objects into equal groups and through discussion they will begin to solve problems involving halving and sharing. I have 10 cubes, can you share them equally into 2 groups? Children use counters with part-part whole model.	Children to use pictures to support their sharing of quantities. 12 shared between 3 is 4 Children find ½ using counters and can also show this by drawing their own representations.	12 shared between 3 is 4. Also introduce division sign 12 ÷ 3 = 4 Foundation to be shown number sentence alongside pictorial and concrete support.
Year 2	Use counters, cubes or place value counters to aide understanding.	Use bar modelling or number lines to support understanding.	28 ÷ 7 = 4



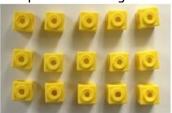






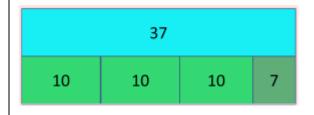


Make stronger links to division and multiplication through the use of arrays.

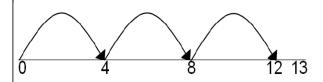


15 divide by 5 = 3

37 divided by 10



Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.



Draw dots and group them to divide an amount and clearly show a remainder.





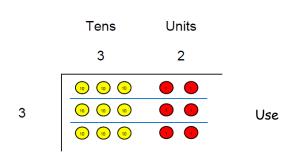




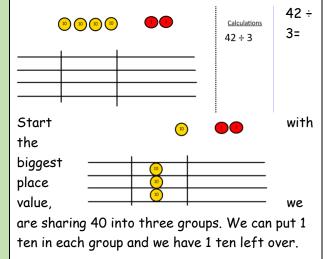




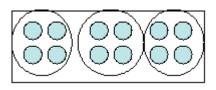




place value counters to divide using the bus stop method alongside



Students can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.



Encourage them to move towards counting in multiples to divide more efficiently.

Begin with divisions that divide equally with no remainder.

Finally move into decimal places to divide the total accurately.





1. Divide. 2. Multiply & subtract. 3. Drop down the next digit. h t o h t o h t o	1. Divide. 2. Multiply & subtract. 3. Drop down the next digit.	Year 6	We exchange this ten for ten ones and share the ones equally among the group 10 11 10 11 10 11 10 11 11 11 11 11 12 13 14 15 16 16 17 18 19 19 19 19 19 19 19 19 19 19 19 19 19	S.	
		Year 6	1. Divide.		hto





Divide.	Multiply & subtract.	Drop down the next digit.
13 2)278 -2 07	13 2)278 -2 07 -6	13 2)278 -2 07 -6
Divide 2 into 7. Place 3 into the quotient.	Multiply 3 × 2 = 6, write that 6 under the 7, and subtract to find the remainder of 1 ten.	Next, drop down the 8 of the ones next to the 1 leftover ten.
1. Divide.	2. Multiply & subtract.	3. Drop down the next digit.
13 <mark>9 2)278 -2 07 -6</mark>	139 2)278 -2 07 -6 18 -18	139 2)278 -2 07 -6 18 -18
Divide 2 into 18. Place 9 into the quotient.	Multiply 9 × 2 = 18, write that 18 under the 18, and subtract to find the	There are no more digits to drop down. The quotient is 139.