THE DISTRICT

CE PRIMARY SCHOOL

Calculation Policy

Calculation Policy : Progression of Objectives

	EYFS / Y1	Y2	Y3	Y4	Y5	Y6
ADDITION	Combining two parts to make a whole: part whole model. Starting at the bigger number and counting on- using cubes. Regrouping to make 10 using ten frame.	Adding three single digits. Use of base 10 to combine two numbers.	Column method- regrouping. Using place value counters (up to 3 digits).	Column method- regrouping. (up to 4 digits)	Column method- regrouping. Use of place value counters for adding decimals.	Column method- regrouping. Abstract methods. Place value counters to be used for adding decimal numbers.
SUBTRACTION	Taking away ones Counting back Find the difference Part whole model Make 10 using the ten frame	Counting back Find the difference Part whole model Make 10 Use of base 10	Column method with regrouping. (up to 3 digits using place value counters)	Column method with regrouping. (up to 4 digits)	Column method with regrouping. Abstract for whole numbers. Start with place value counters for decimals- with the same amount of decimal places.	Column method with regrouping. Abstract methods. Place value counters for decimals- with different amounts of decimal places.

	EYFS / Y1	Y2	Y3	Y4	Y5	Y6
MULTIPLICATION	Recognising and making equal groups. Doubling Counting in multiples Use cubes, Numicon and other objects in the classroom	Arrays- showing commutative multiplication	Arrays 2d × 1d using base 10	Column multiplication- introduced with place value counters. (2 and 3 digit multiplied by 1 digit)	Column multiplication Abstract only but might need a repeat of year 4 first(up to 4 digit numbers multiplied by 1 or 2 digits)	Column multiplication Abstract methods (multi-digit up to 4 digits by a 2 digit number) Multiply 1d with 2dp by whole number
DIVISION	Sharing objects into groups Division as grouping e.g. I have 12 sweets and put them in groups of 3, how many groups? Use cubes and draw round 3 cubes at a time.	Division as grouping Division within arrays- linking to multiplication Repeated subtraction	Division with a remainder-using lollipop sticks, times tables facts and repeated subtraction. 2d divided by 1d using base 10 or place value counters	Division with a remainder Short division (up to 3 digits by 1 digit- concrete and pictorial)	Short division (up to 4 digits by a 1 digit number including remainders)	Short division Long division with place value counters (up to 4 digits by a 2 digit number) Children should exchange into the tenths and hundredths column too

Calculation Policy : Progression of Vocabulary

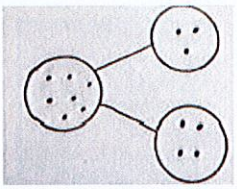
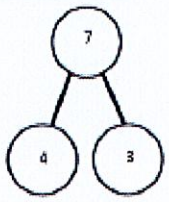
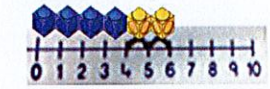
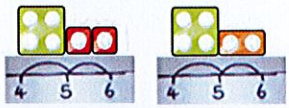
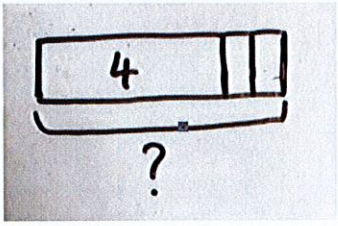
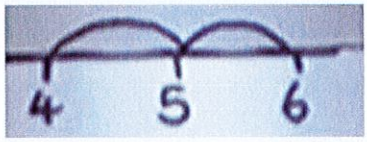
	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
ADDITION & SUBTRACTION	add, more, and make, sum, total altogether double one more, two more ... ten more how many more to make ...? how many more is ... than ...? how much more is ...? take away how many are left/left over? how many have gone? one less, two less, ten less ... how many fewer is ... than ...? how much less is ...? difference between	addition add, more, and make, sum, total altogether double near double half, halve one more, two more ... ten more how many more to make ...? how many more is ... than ...? how much more is ...? subtract take away how many are left/left over? how many have gone? one less, two less, ten less ... how many fewer is ... than ...? how much less is ...? difference between equals is the same as number bonds/pairs missing number	addition add, more, and make, sum, total altogether double near double half, halve one more, two more ... ten more ... one hundred more how many more to make ...? how many more is ... than ...? how much more is ...? subtract take away how many are left/left over? how many have gone? one less, two less, ten less ... one hundred less how many fewer is ... than ...? how much less is ...? difference between equals is the same as number bonds/pairs/facts tens boundary	addition add, more, and make, sum, total altogether double near double half, halve one more, two more ... ten more ... one hundred more how many more to make ...? how many more is ... than ...? how much more is ...? subtract take away how many are left/left over? how many have gone? one less, two less, ten less ... one hundred less how many fewer is ... than ...? how much less is ...? difference between equals is the same as number bonds/pairs/facts missing number tens boundary, hundreds boundary	addition add, more, and make, sum, total altogether double near double half, halve one more, two more... ten more... one hundred more how many more to make ...? how many more is ... than ...? how much more is ...? subtract take away how many are left/left over? how many have gone? one less, two less, ten less ... one hundred less how many fewer is ... than ...? how much less is ...? difference between equals is the same as number bonds/pairs/facts missing number tens boundary, hundreds boundary inverse	addition add, more, and make, sum, total altogether double near double half, halve one more, two more ... ten more ... one hundred more how many more to make ...? how many more is ... than ...? how much more is ...? subtract take away how many are left/left over? how many have gone? one less, two less, ten less ... one hundred less how many fewer is ... than ...? how much less is ...? difference between equals is the same as number bonds/pairs/facts missing number tens boundary, hundreds boundary, ones boundary, tenths boundary inverse	addition add, more, and make, sum, total altogether double near double half, halve one more, two more ... ten more ... one hundred more how many more to make ...? how many more is ... than ...? how much more is ...? subtract take away how many are left/left over? how many have gone? one less, two less, ten less ... one hundred less how many fewer is ... than ...? how much less is ...? difference between equals is the same as number bonds/pairs/facts missing number tens boundary, hundreds boundary, ones boundary, tenths boundary inverse

	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
MULTIPLICATION & DIVISION	<u>**doubling**</u> <u>**number patterns**</u> <u>**sharing**</u> <u>**halving**</u> <u>**number patterns**</u>	<u>**multiplication**</u> <u>**multiply**</u> <u>**multiplied by**</u> <u>**multiple**</u> <u>**division**</u> <u>**dividing**</u> <u>**grouping**</u> sharing doubling halving <u>**array**</u> number patterns	multiplication multiply multiplied by multiple <u>**groups of**</u> <u>**times**</u> <u>**once, twice, three times … ten times**</u> <u>**repeated addition**</u> division dividing, divide, divided by, divided into grouping sharing, share, share equally left, left over one each, two each, three each … ten each group in pairs, threes … tens equal groups of doubling halving array row, column number patterns multiplication table multiplication fact, division fact	multiplication multiply multiplied by multiple, <u>**factor**</u> groups of times <u>**product**</u> once, twice, three times … ten times repeated addition division dividing, <u>**divide, divided by, divided into**</u> left, left over, <u>**remainder**</u> grouping sharing, <u>**share, share equally**</u> <u>**one each, two each, three each … ten each**</u> <u>**group in pairs, threes … tens**</u> <u>**equal groups of**</u> doubling halving array <u>**row, column**</u> number patterns <u>**multiplication table**</u> <u>**multiplication fact, division fact**</u>	multiplication multiply multiplied by multiple, factor groups of times product once, twice, three times … ten times repeated addition division dividing, divide, divided by, divided into left, left over, remainder grouping sharing, share, share equally one each, two each, three each … ten each group in pairs, threes … tens equal groups of doubling halving array row, column number patterns multiplication table multiplication fact, division fact <u>**inverse**</u> <u>**square, squared**</u> <u>**cube, cubed**</u>	multiplication multiply multiplied by multiple, factor groups of times product once, twice, three times … ten times repeated addition division dividing, divide, divided by, divided into left, left over, remainder grouping sharing, share, share equally one each, two each, three each … ten each group in pairs, threes … tens equal groups of doubling halving array row, column number patterns multiplication table multiplication fact, division fact inverse square, squared cube, cubed	multiplication multiply multiplied by multiple, factor groups of times product once, twice, three times … ten times repeated addition division dividing, divide, divided by, divided into left, left over, remainder grouping sharing, share, share equally one each, two each, three each … ten each group in pairs, threes … tens equal groups of doubling halving array row, column number patterns multiplication table multiplication fact, division fact inverse square, squared cube, cubed

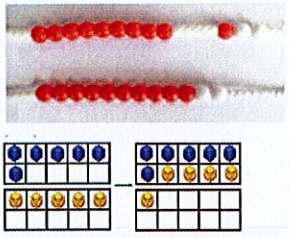
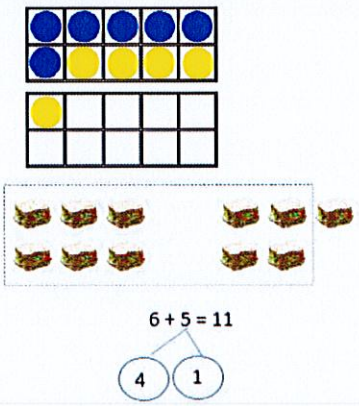
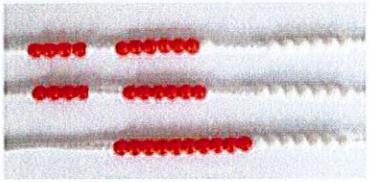
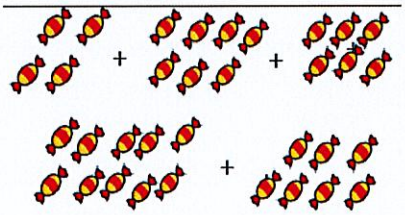
Calculation Policy : **Addition**

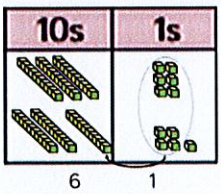
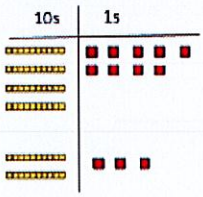
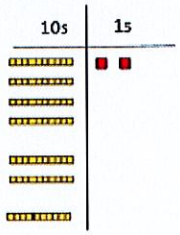
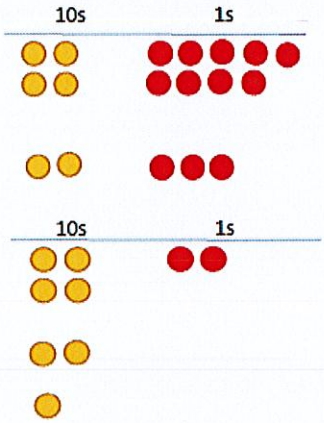
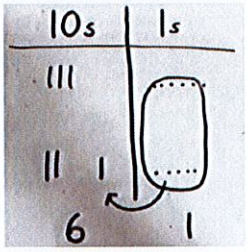
Key language : sum, total, parts and wholes, plus, add, altogether, more, 'is equal to', 'is the same as'.

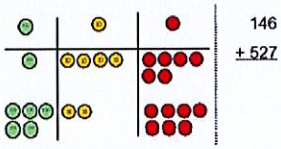
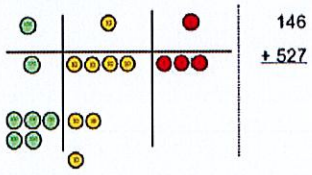
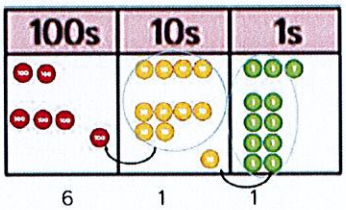
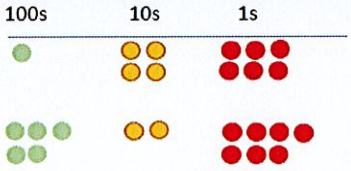
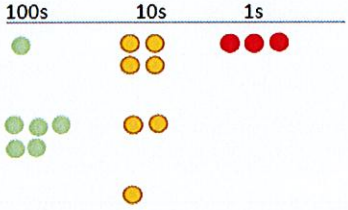
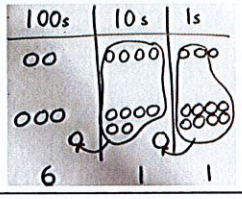
THE DISTRICT CE PRIMARY SCHOOL

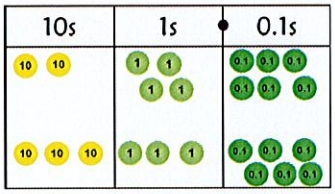
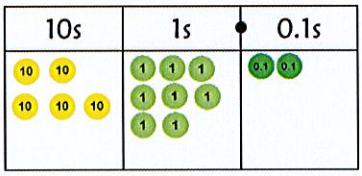
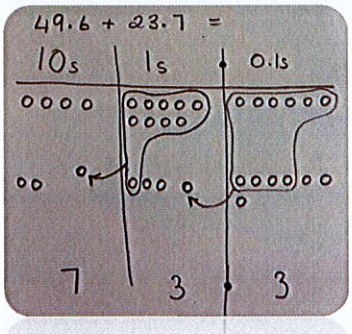
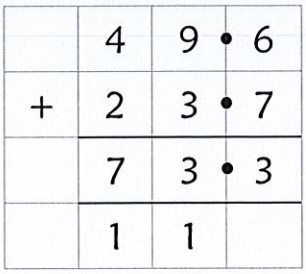
	OBJ	CONCRETE	PICTORIAL	ABSTRACT
EYFS / YEAR 1	Combining two parts to make a whole	Use range of resources e.g. cubes, eggs, shells, teddy bears, cars). 	Children to represent the cubes using dots or crosses. They could put each part on a part whole model too. 	4 + 3 = 7 Four is a part, 3 is a part and the whole is seven. 
EYFS / YEAR 1	Counting on using number lines	Using cubes, bead strings or Numicon.    Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.	A bar model which encourages the children to count on, rather than count all. What is the whole? 	The abstract number line: What is 2 more than 4? What is the sum of 2 and 4? What is the total of 4 and 2? 4 + 2 

**** Addition on a number line to be shown ABOVE the number line.***

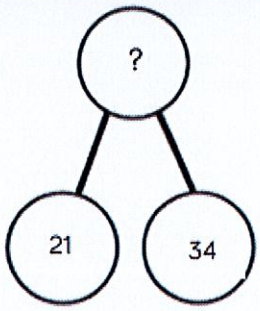
		CONCRETE	PICTORIAL	ABSTRACT
EYFS / YEAR 1	Regrouping to make 10	using bead strings, ten frames and counters/cubes or using Numicon. Start with the bigger number and use the smaller number to make 10. 6 + 5 	Children to draw the ten frame and counters/cubes.  	Children to develop an understanding of equality e.g. $6 + \square = 11$ $6 + 5 = 5 + \square$ $6 + 5 = \square + 4$
YEAR 2	Adding 3 single digit numbers	4 + 7 + 6= 17 Put 4 and 6 together to make 10. Add on 7.  Following on from making 10, make 10 with 2 of the digits (if possible) then add on the third digit.	 Add together three groups of objects. Draw a picture to recombine the groups to make 10.	Combine the two numbers that make 10 and then add on the remainder. $4 + 7 + 6 = \boxed{10} + \boxed{7}$ 10 $= \boxed{17}$

		CONCRETE	PICTORIAL	ABSTRACT
YEAR 3	TO + TO using base 10 Column method with regrouping	Continue to develop understanding of partitioning and place value. 36 + 25  Make both numbers on a place value grid.  Add up the units and exchange 10 ones for 1 ten.  	Using place value counters, children can draw the counters to help them to solve additions.  Children to represent the base 10 in a place value chart.  	40 + 9 20 + 3 60 + 12 = 72 Looking for ways to make 10. 36 + 25 = 1 5 30 + 20 = 50 5 + 5 = 10 50 + 10 + 1 = 61 Formal method: 36 +25 61 1

		CONCRETE	PICTORIAL	ABSTRACT
YEAR 3 / 4	Use of place value counters to add HTO + TO, HTO + HTO etc	Make both numbers on a place value grid.  Add up the units and exchange 10 ones for 1 ten.  When there are 10 ones in the 1s column- we exchange for 1 ten, when there are 10 tens in the 10s column- we exchange for 1 hundred.  NB By Year 4 children will progress on toadding four digit numbers.	  Children can draw a pictorial representation of the columns and place value counters to further support their learning and understanding. NB Addition of money needs to have £ and p added separately. Children to represent the counters in a place value chart, circling when they make an exchange.  	100 + 40 + 6 500 + 20 + 7 600 + 70 + 3 = 673 As the children progress, they will move from the expanded to the compacted method. 243 +368 611 1 1

		CONCRETE	PICTORIAL	ABSTRACT
YEAR 5 / 6	Use of place value counters to add decimal numbers	Place both numbers on the place value chart Begin with the tenths and exchange 10 tenths for 1 one. 24.6 + 33.6 =   Ensure decimal point is lined up correctly ON the line.	Children to represent the counters in a place value chart, circling when they make an exchange.  	

Conceptual variation; different ways to ask children to solve 21 + 34



?	
21	34

Word problems:

In year 3, there are 21 children and in year 4, there are 34 children. How many children in total?

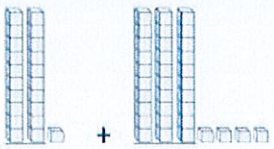
21 + 34 = 55. Prove it

21
+34
___

21 + 34 =

☐ = 21 + 34

Calculate the sum of twenty-one and thirty-four.



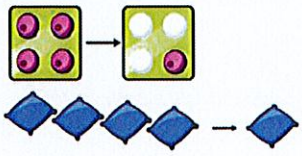
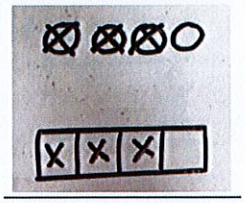
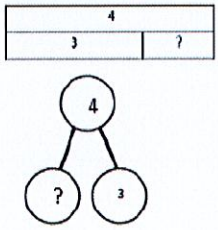
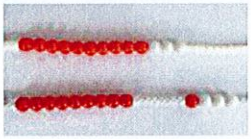
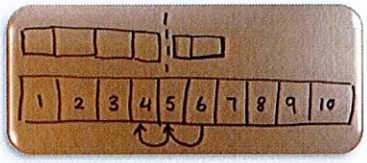
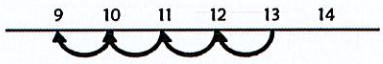
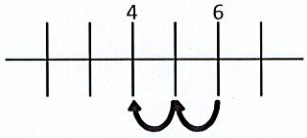
Missing digit problems:

10s	1s
	?
?	5

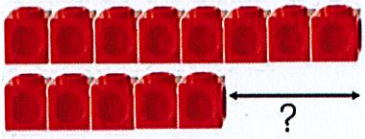
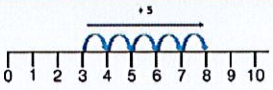
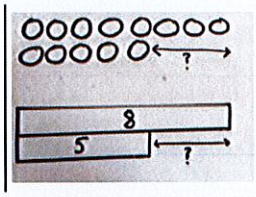
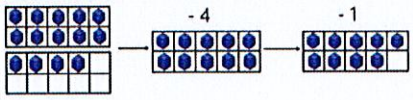
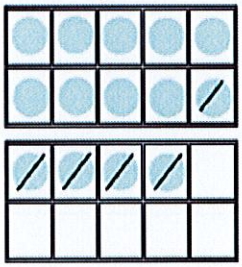
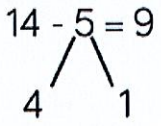
Calculation Policy : Subtraction

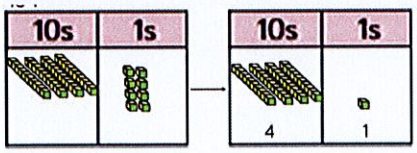
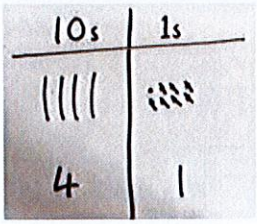
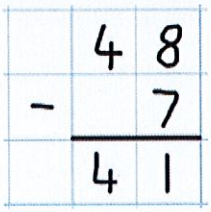
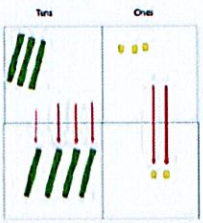
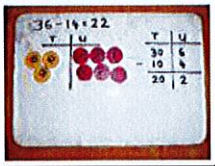
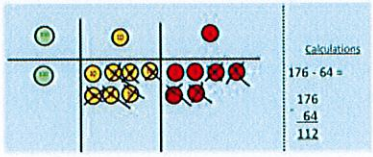
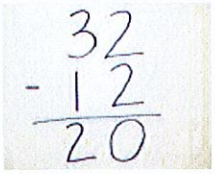
Key language : take away, less than, the difference, subtract, minus, fewer, decrease.

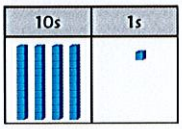
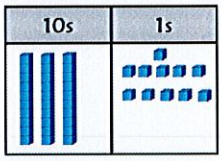
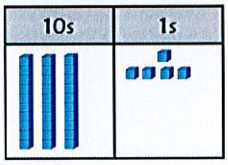
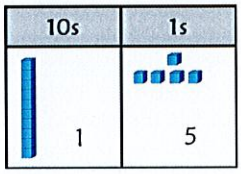
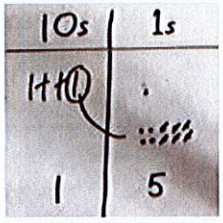
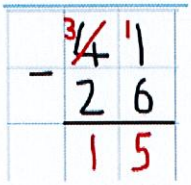
THE DISTRICT CE PRIMARY SCHOOL

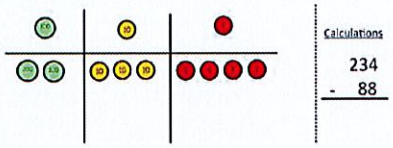
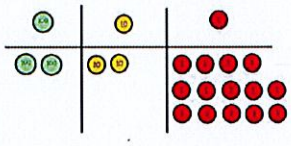
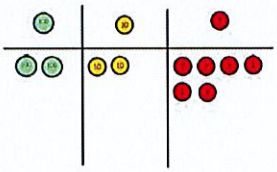
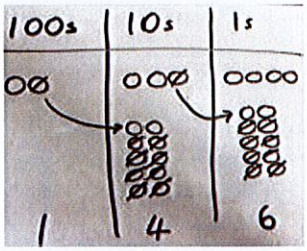
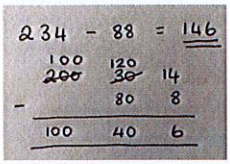
	OBJ	CONCRETE	PICTORIAL	ABSTRACT
EYFS / YEAR 1	Physically taking away and removing objects from a whole	(ten frames, Numicon, cubes and other items such as beanbags could be used). 4 - 3 = 1 	Children to draw the concrete resources they are using and cross out the correct amount. The bar model can also be used. 	4- 3 = ☐ = 4 - 3 
YEAR 1	Counting Back	(using number lines or number tracks) children start with 6 and count back 2. 6 - 2 = 4  Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones. 	Children to represent what they see pictorially e.g. 	Count back on a number line or number track  Children to represent the calculation on a number line or number track and show their jumps. Encourage children to use an empty number line  Put 13 in your head, count back 4. Whatnumber are you at? Use your fingers to help.

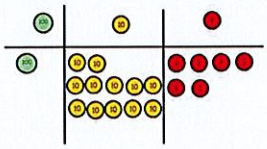
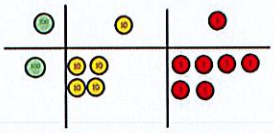
**** Subtraction on a number line to be shown BELOW the number line.***

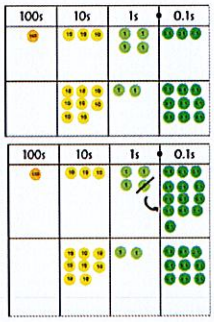
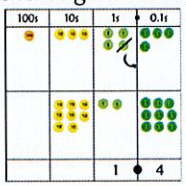
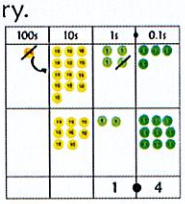
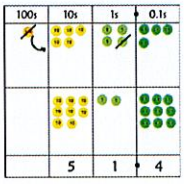
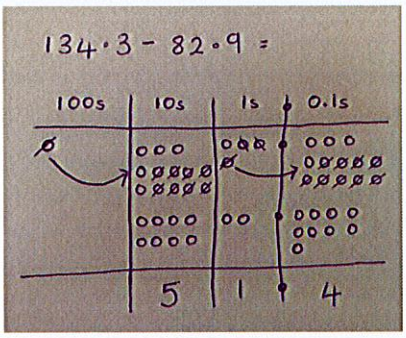
		CONCRETE	PICTORIAL	ABSTRACT
YEAR 1	Finding the difference	(using cubes, Numicon or Cuisenaire rods, other objects can also be used). Calculate the difference between 8 and 5. 	 Children to count on to find the difference. Children to draw the cubes/other concrete objects which they have used or use the bar model to illustrate what they need to calculate. 	Find the difference between 8 and 5. 8 – 5, the difference is ☐ Children to explore why 9 - 6 = 8 – 5 = 7 – 4 have the same difference. Hannah has 8 goldfish. Helen has 3 goldfish. Find the difference between the number of goldfish the girls have.
YEAR 1	Making 10 Using the tens frame	14 – 5 	Children to present the ten frame pictorially and discuss what they did to make 10. 	Children to show how they can make 10 by partitioning the subtrahend.  14 – 4 = 10 10 – 1 = 9

		CONCRETE	PICTORIAL	ABSTRACT
YEAR 1	Column Method using base 10	48 - 7  	Children to represent the base 10 pictorially.  	Column method or children could count back 7. 
YEAR 2	Column method without exchanging	75 – 42 = 33  Use Base 10 to make the bigger number then take the smaller number away. Show how you partition numbers to subtract. Make the larger number first.  	 Draw the Base 10 or place value counters alongside the written calculation to help to show working.  	47 – 24 = 23 40 + 7 – 20 + 4 20 + 3 This will lead to a clear written column subtraction 

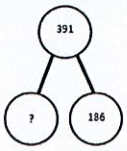
		CONCRETE	PICTORIAL	ABSTRACT
YEAR 2	Column Method using base 10 and having to exchange	41 – 26 Start by making the larger number with the base 10.  Look at the ones. Can I take away 6 from 1 easily? I need to exchange 1 of my tens for ten ones.  Now I can subtract the ones.  Now I can subtract the tens  	Represent the base 10 pictorially, remembering to show the exchange.  	Formal column method. Children must understand that when they have exchanged the 10 they still have 41 because 41 = 30 + 11. 

		CONCRETE	PICTORIAL	ABSTRACT
YEAR3 Onwards	Column Method with regrouping	Use Base 10 to start with before moving on to place value counters. Start with one exchange before moving onto subtractions with 2 exchanges. Make the larger number with the place value counters.  Calculations 234 - 88 Start with the ones, can I take away 8 from 4 easily? I need to exchange 1 of my tens for 10 ones.  Calculations 234 - 88 Now I can subtract my ones.  Calculations 234 - 88	Represent the place value counters pictorially; remembering to show what has been exchanged.  	Children can start their formal written method by partitioning the number into clear place value columns.  Moving forward the children use a more compact method. This will lead to an understanding of subtracting any number including decimals.  Formal column method. Children must understand what has happened when they have crossed out digits. 5 12 1 2 6 3 . 0 - 2 6 . 5 2 3 6 . 5

		CONCRETE	PICTORIAL	ABSTRACT
YEAR3 Onwards	Column Method with regrouping cont.	Now look at the tens, can I take away 8 tens easily? I need to exchange 1 hundred for 10 tens.  Calculations 234 - 88 Now I can take away 8 tens and complete my subtraction.  Calculations 1 2 3 4 - 88 146 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.		

		CONCRETE	PICTORIAL	ABSTRACT
YEAR 5 / 6	Use of place value counters to subtract decimal numbers	Place both numbers on the place value chart Begin with the tenths and exchange 10 tenths for 1 one. 134.3 – 82.9 =  Ensure decimal point is lined up correctly ON the line. Subtract the ones, tens etc and exchange if necessary.    	Children to represent the counters in a place value chart, circling when they make an exchange.  	$\begin{array}{\|c\|c\|c\|c\|c\|} \hline & {}^{0}\cancel{1} & {}^{1}3 & {}^{3}\cancel{4}\bullet & {}^{1}3 \\ \hline + & & 8 & 2\bullet & 9 \\ \hline & & 5 & 1\bullet & 4 \\ \hline & & & & \\ \hline \end{array}$

Conceptual variation; different ways to ask children to solve 391 - 186



391	
186	?

Raj spent £391, Timmy spent £186.
How much more did Raj spend?

Calculate the difference between 391 and 186.

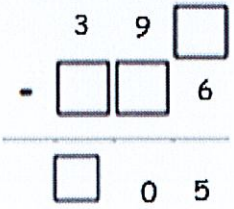
□ = 391 – 186

391

-186

What is 186 less than 391?

Missing digit calculations



Calculation Policy : **Multiplication**

Key language: double, times, multiplied by, the product of, groups of, lots of, equal groups.

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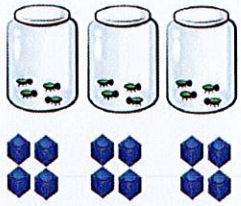
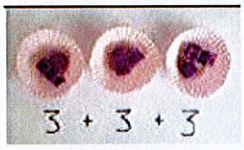
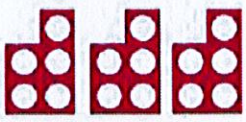
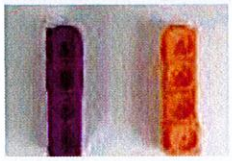
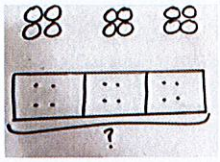
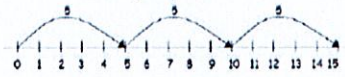
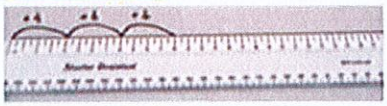
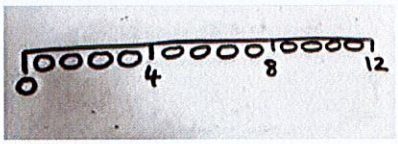
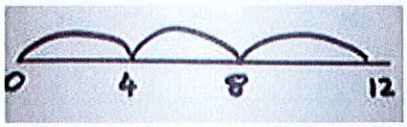
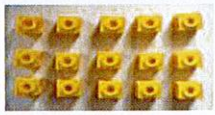
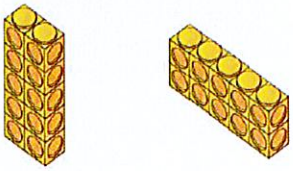
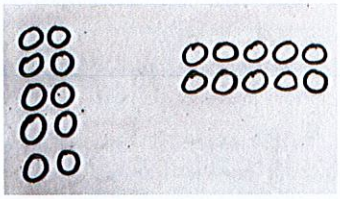
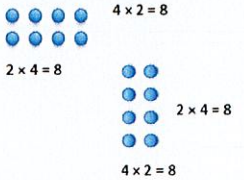
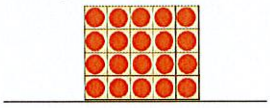
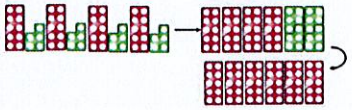
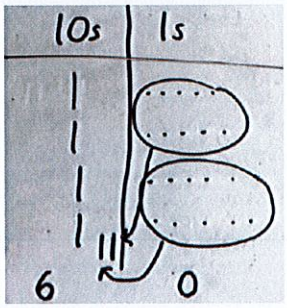
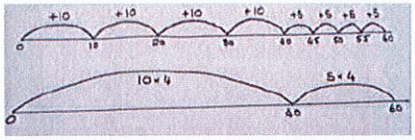
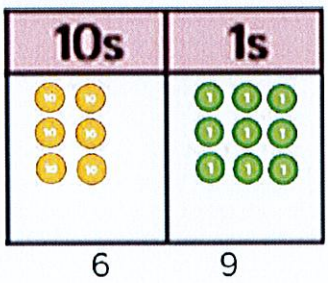
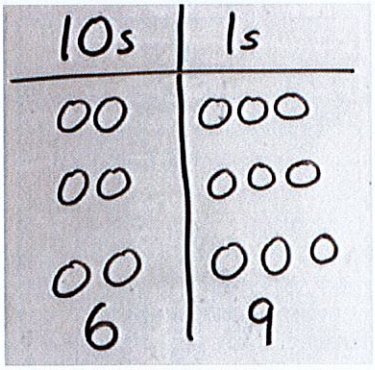
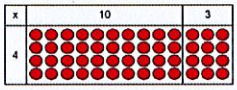
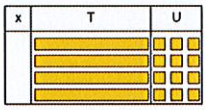
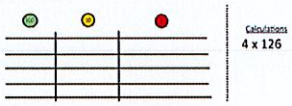
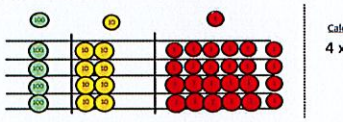
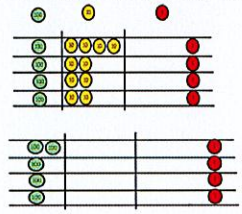
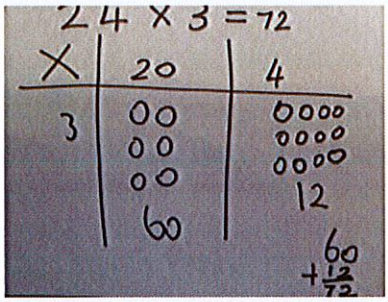
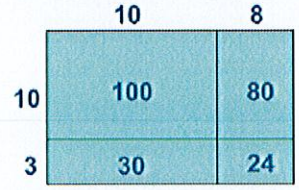
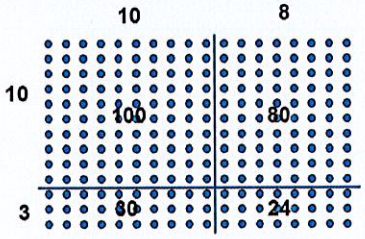
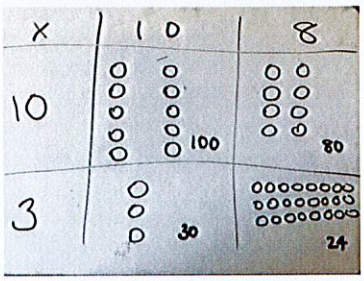
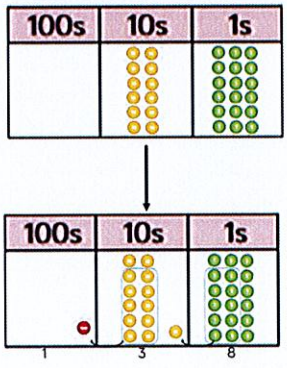
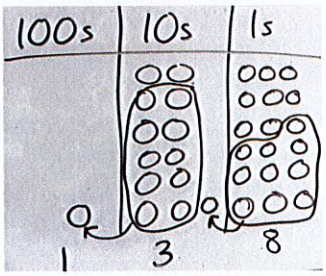
	OBJ	CONCRETE	PICTORIAL	ABSTRACT
YEAR 1/ 2	Repeated grouping / addition	Use different objects to add equal groups. 3 × 4 4 + 4 + 4 There are 3 equal groups, with 4 in each group.    	Children to represent the practical resources in a picture and use a bar model. What is the whole?  There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there?  2 + 2 + 2 = 6  5 + 5 + 5 = 15	Write addition sentences to describe objects and pictures.  2 + 2 + 2 = 6 3 × 4 = 12 4 + 4 + 4 = 12

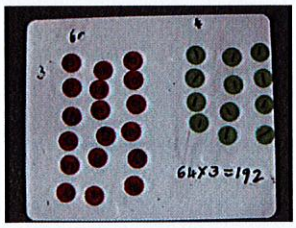
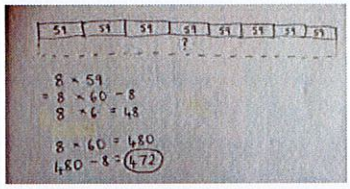
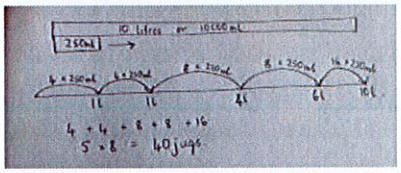
	OBJ	CONCRETE	PICTORIAL	ABSTRACT
YEAR 1/ 2	Number lines to show repeated groups	3 × 4   Cuisenaire rods can be used too.	Represent this pictorially alongside a number line e.g.: 	Abstract number line showing three jumps of four. 3 × 4 = 12 
	Arrays- showing commutative multiplication	Create arrays using counters/cubes to show multiplication sentences.   2 × 5 = 5 × 2 	Children to represent the arrays pictorially.  Draw arrays in different rotations to find commutative multiplication sentences.  Link arrays to area of rectangles. 	Children to be able to use an array to write a range of calculations e.g. 10 = 2 × 5 5 × 2 = 10 2 + 2 + 2 + 2 + 2 = 10 10 = 5 + 5  5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15 5 x 3 = 15 3 x 5 = 15

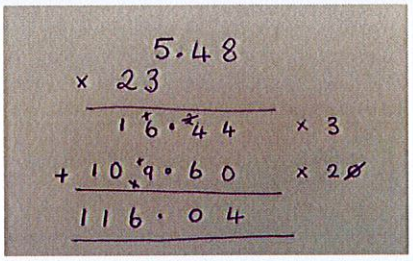
	OBJ	CONCRETE	PICTORIAL	ABSTRACT
YEAR3	Partition to multiply 2d x 1d	Using Numicon, base 10 or Cuisenaire rods. 4 × 15  Could also use tens frame, and counters	Children to represent the concrete manipulatives pictorially.  	Children to be encouraged to show the steps they have taken. 4 x 15 10 5 10 x 4 = 40 5 x 4 = 20 40 + 20 = 60 A number line can also be used 
YEAR 4	Formal column method with place value counters	Formal column method with place value counters (base 10 can also be used.) 3 × 23  	Children to represent the counters pictorially.  	Children to record what it is they are doing to show understanding. 3 × 23 20 3 3 × 20 = 60 3 × 3 = 9 60 + 9 = 69 23 × 3 69

	OBJ	CONCRETE	PICTORIAL	ABSTRACT
YEAR3 / 4	Grid Method	Show the link with arrays to first introduce the grid method.  4 rows of 10 4 rows of 3 Move on to using Base 10 to move towards a more compact method.  4 rows of 13 Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows.  Calculations 4 x 126 Fill each row with 126.  Calculations 4 x 126 Add up each column, starting with the ones making any exchanges needed.  Then you have your answer.	Children can represent the work they have done with place value counters in a way that they understand. They can draw the counters, using colours to show different amounts or just use 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. **210 + 35 = 245** Moving forward, multiply by a 2 digit number showing the different rows within the grid method. 

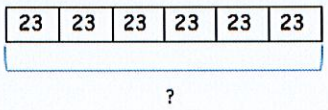
X	1000	300	40	2
10	10000	3000	400	20
8	8000	2400	320	16

	OBJ	CONCRETE	PICTORIAL	ABSTRACT
YEAR3 / 4	Formal Column Method with place value counters.	Show the link with arrays to first introduce the expanded method. 		Start with long multiplication, reminding the children about lining up their numbers clearly in columns. 18 x 13 24 (3 x 8) 30 (3 x 10)) 80 (10 x 8) 100 (10 x 10) 234
YEAR 5/6	Formal Column Method with place value counters.	6 x 23 	Children to represent the counters/base 10, pictorially e.g. the image below. 	Formal written method 6 x 23 = 23 x 6 138 1 1

	OBJ	CONCRETE	PICTORIAL	ABSTRACT
YEAR 5 / 6	Formal (compact method	Children can continue to be supported by place value counters at the stage of multiplication.  It is important at this stage that they always multiply the ones first and note down their answer followed by the tens which they note below.	Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.  	Start with long multiplication, reminding the children about lining up their numbers clearly in columns. If it helps, children can write out what they are solving next to their answer. 7 4 × 6 3 1 2 2 1 0 2 4 0 + 4 2 0 0 4 6 6 2 This moves to the more compact method. 2 3 1 1342 x 18 13420 10736 24156 1
YEAR 5 / 6	3d x 3d and 4d x 2d	When children start to multiply 3d × 3d and 4d × 2d etc., they should be confident with the abstract: To get 744 children have solved 6 × 124. To get 2480 they have solved 20 × 124.		1 2 4 × 2 6 7 4 4 1 2 2 4 8 0 3 2 2 4 1 1 Answer: 3224

	OBJ	CONCRETE	PICTORIAL	ABSTRACT
YEAR 6	Multiply 1d wit 2dp by whole numbers	When children start to multiply decimals they should be confident with recall of associated facts (5 x 0.1) and the effect of place value. They must also be competent in the formal column method of whole numbers. 2.17 x 6 5.48 x 23		

Conceptual variation; different ways to ask children to solve 6 x 23



Mai had to swim 23 lengths, 6 times a week.

How many lengths did she swim in one week?

With the counters, prove that 6 x 23 = 138

Find the product of 6 and 23

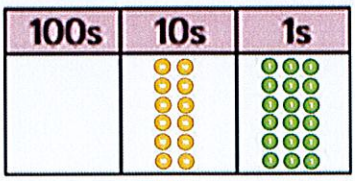
6 × 23 =

□ = 6 × 23

6 × 23 = ___

23 × 6 = ___

What is the calculation?
What is the product?



Calculation Policy : **Division**

Key language: share, group, divide, divided by, half.

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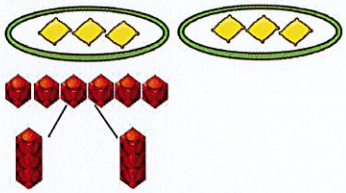
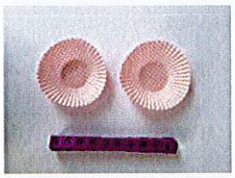
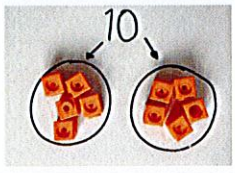
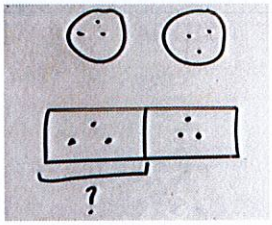
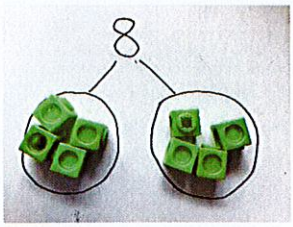
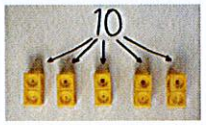
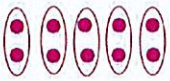
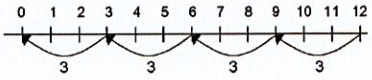
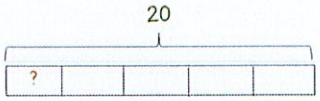
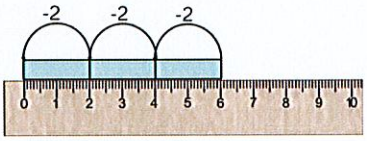
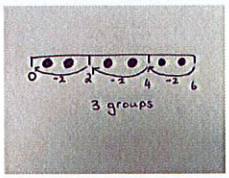
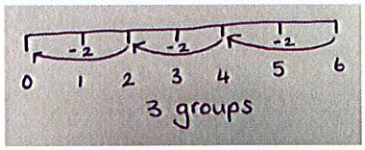
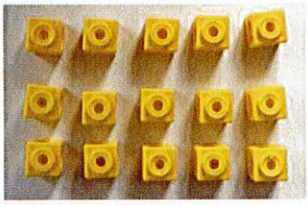
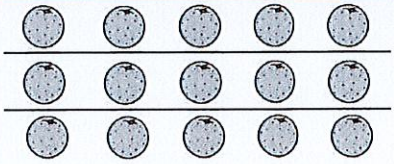
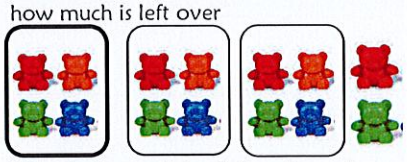
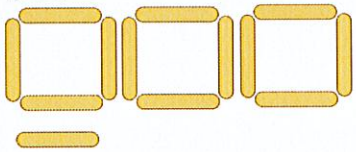
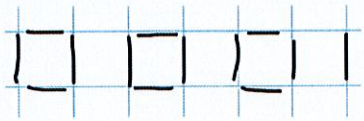
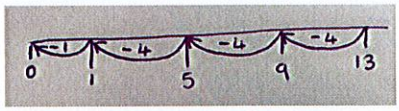
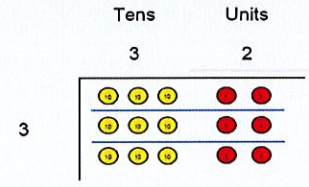
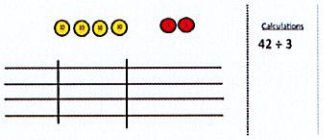
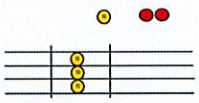
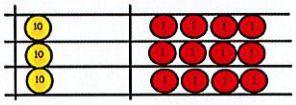
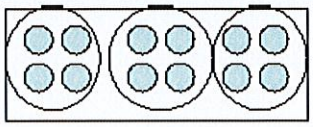
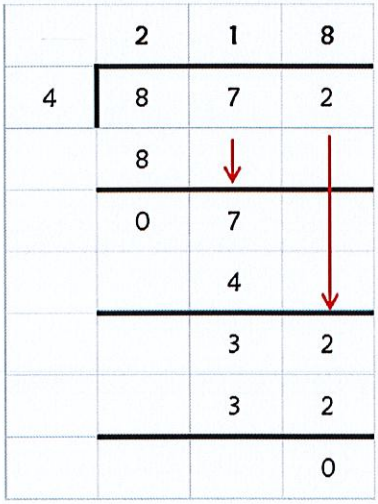
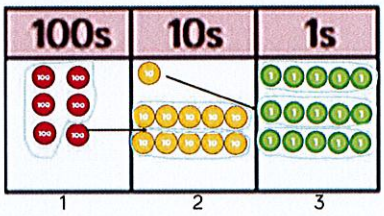
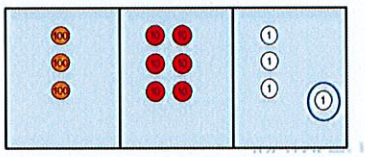
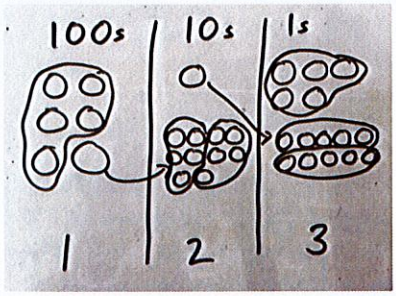
	OBJ	CONCRETE	PICTORIAL	ABSTRACT
YEAR 1/ 2	Sharing	Sharing using a range of objects. 6 ÷ 2  I have 8 cubes, can you share them equally between two people?   	Children use pictures or shapes to share quantities.  8 ÷ 2 = 4 Represent the sharing pictorially. 	Share 8 buns between two people. 8 ÷ 2 = 4  6 ÷ 2 = 3 3 | 3 Children should also be encouraged to use their 2 times tables facts.

	OBJ	CONCRETE	PICTORIAL	ABSTRACT
YEAR 1/ 2	Grouping	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.    96 ÷ 3 = 32  	Use a number line to show jumps in groups. The number of jumps equals the number of groups.  Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.  20 ÷ 5 = ? 5 x ? = 20	28 ÷ 7 = 4 Divide 28 into 7 groups. How many are in each group?
Year 2	Repeated Subtraction	Using Cuisenaire rods above a ruler. 6 ÷ 2  3 groups of 2	Children to represent repeated subtraction pictorially.  	Abstract number line to represent the equal groups that have been subtracted. 

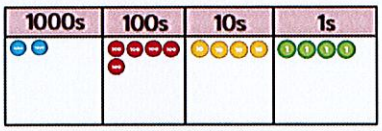
** Repeated subtraction on a number line to be shown BELOW the number line.*

	OBJ	CONCRETE	PICTORIAL	ABSTRACT
YEAR 2	Division with arrays	Link division to year group times table facts. (inc fact families) Highlight link to fractions ¼ and ½ Create an array and thinking about the number sentences that can be created.  Eg 15 ÷ 3 = 5 5 x 3 = 15 15 ÷ 5 = 3 3 x 5 = 15	 Draw an array and use lines to split the array into groups to make multiplication and division sentences.	Find the inverse of multiplication and division sentences by creating four linking number sentences. 7 x 4 = 28 4 x 7 = 28 28 ÷ 7 = 4 28 ÷ 4 = 7
YEAR 3	2D ÷ 1D Division with a remainder	14 ÷ 3 = Divide objects between groups and see how much is left over  Using lollipop sticks. Cuisenaire rods, above a ruler can also be used. 13 ÷ 4  Use of lollipop sticks to form wholes- squares are made because we are dividing by 4. There are 3 whole squares, with 1 left over.	Children to represent the lollipop sticks pictorially.  There are 3 whole squares, with 1 left over. Draw dots and group them to divide an amount and clearly show a remainder. 	13 ÷ 4 – 3 remainder 1 Children should be encouraged to use their times table facts; they could also represent repeated addition on a number line. '3 groups of 4, with 1 left over'  Complete written divisions and show the remainder using r. 29 ÷ 8 = 3 REMAINDER 5 ↑ ↑ ↑ ↑ dividend divisor quotient remainder

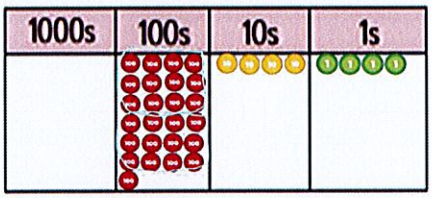
	OBJ	CONCRETE	PICTORIAL	ABSTRACT
YEAR 4	Short Division	 Use place value counters to divide using the bus stop method alongside  42 ÷ 3= Start with the biggest place value, we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over.  We exchange this ten for ten ones and then share the ones equally among the groups.  We look how much in 1 group so the answer is 14.	Students can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups. 	Before moving to the compact method, introduce a bridge to long division. Include division with remainders and decimals. 

	OBJ	CONCRETE	PICTORIAL	ABSTRACT
YEAR 5/6	Short Division with remainders	Short division using place value counters to group. 615 ÷ 5  1. Make 615 with place value counters. 2. How many groups of 5 hundreds can you make with 6 hundred counters? 3. Exchange 1 hundred for 10 tens. 4. How many groups of 5 tens can you make with 11 ten counters? 5. Exchange 1 ten for 10 ones. 6. How many groups of 5 ones can you make with 15 ones? 364 ÷ 3 = 1 2 1 rem 1 3 ⟌ 3 6 4 	Represent the place value counters pictorially.  	Encourage them to move towards counting in multiples to divide more efficiently. 2 1 8 3 4 ⟌ 8 7 2 Move onto divisions with a remainder. 8 6 r 2 3 5 ⟌ 4 3 2 Finally move into decimal places to divide the total accurately. 1 4 . 6 16 21 3 5 ⟌ 5 1 1 . 0 Once children understand remainders, begin to express as a fraction or decimal according to the context. 1 8 6 1/5 5 ⟌ 9 ⁴3 ³1 1 4 . 6 16 21 3 5 ⟌ 5 1 1 . 0

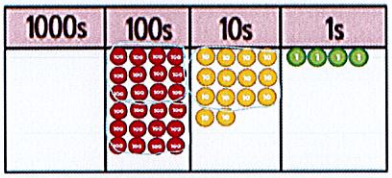
	OBJ	CONCRETE	PICTORIAL	ABSTRACT
YEAR 6	Long Division	Long division using place value counters 2544 ÷ 12		



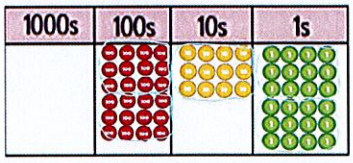
We can't group 2 thousands into groups of 12 so will exchange them.



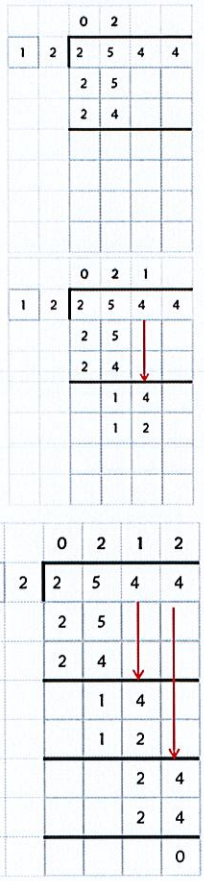
We can group 24 hundreds into groups of 12 which leaves with 1 hundred.



After exchanging the hundred, we have 14 tens. We can group 12 tens into a group of 12, which leaves 2 tens.

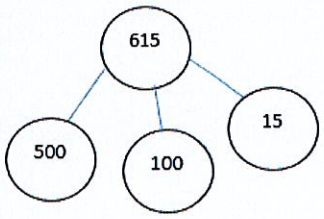


After exchanging the 2 tens, we have 24 ones. We can group 24 ones into 2 group of 12, which leaves no remainder.



Conceptual variation; different ways to ask children to solve 615 ÷ 5

Using the part whole model below, how can you divide 615 by 5 without using short division?



I have £615 and share it equally between 5 bank accounts. How much will be in each account?

615 pupils need to be put into 5 groups. How many will be in each group?

$5\overline{)615}$

615 ÷ 5 =

□ = 615 ÷ 5

What is the calculation?
What is the answer?