Calculation Policy

Preston Grange Primary School

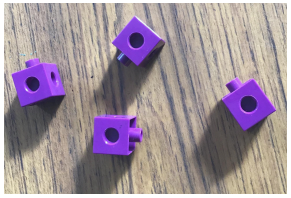
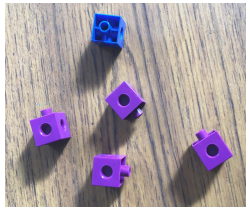
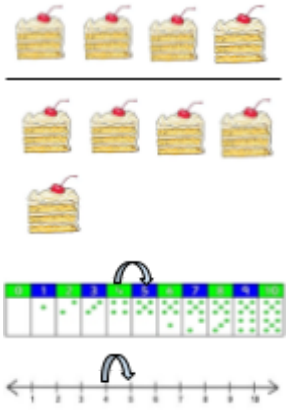
Issue Date: September 2021

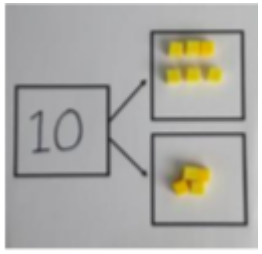
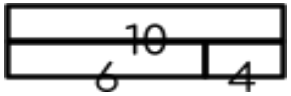
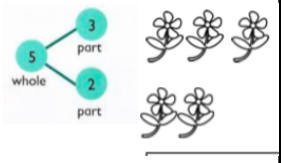
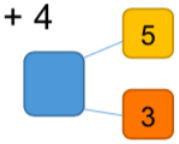
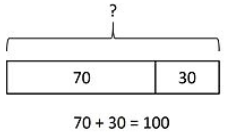
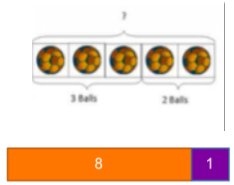
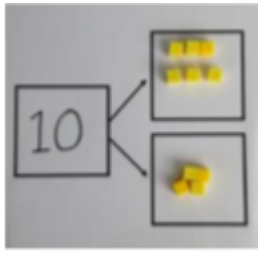
Last reviewed: September 2025

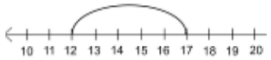
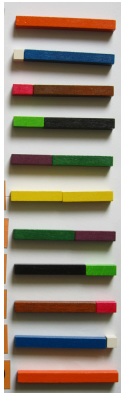
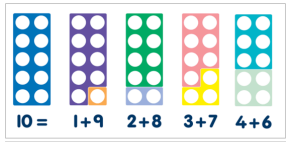
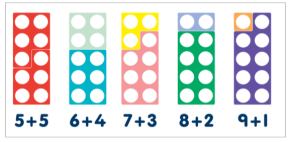
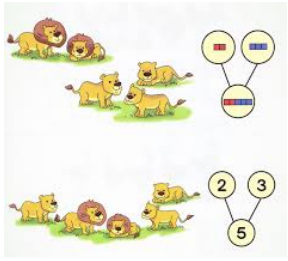
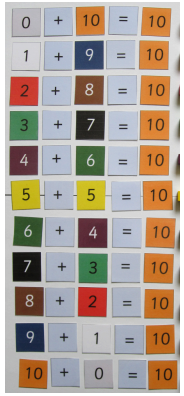
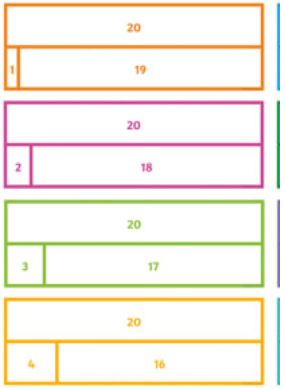
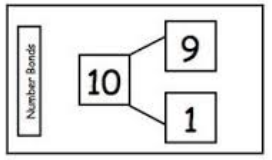
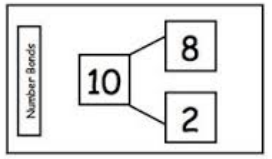
Next review due:September 2027

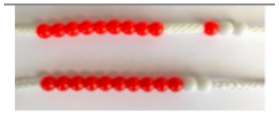
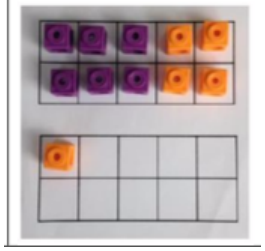
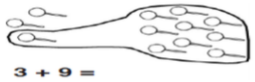
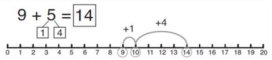
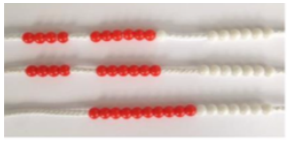
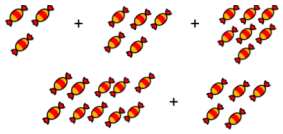
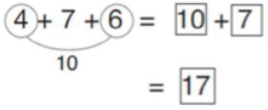
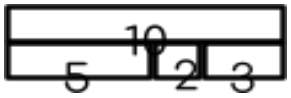
This document outlines the range of strategies we use to ensure that each child has the opportunity to become fluent in the four operations (addition, subtraction, multiplication and division). This document is a working document and provided the most common calculation methods we use across school and the format we expect for certain calculations e.g. column method of addition. The use of certain methods are used at a teacher's discretion as they know the children well and know the most appropriate method to be used to ensure a strong mathematical understanding of the concept.

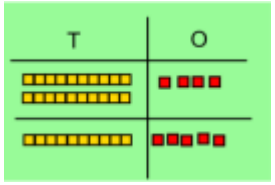
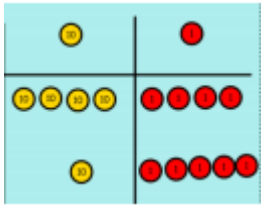
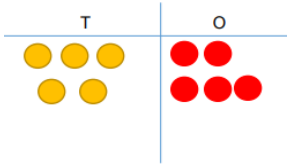
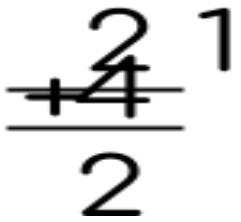
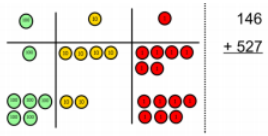
Addition

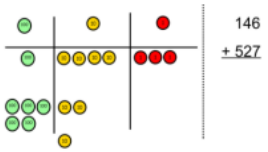
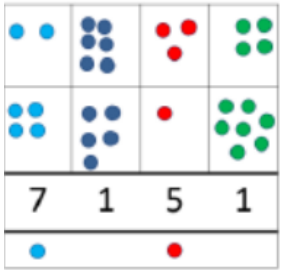
Objective/ Strategy	Concrete	Pictorial	Abstract	Models	Vocab
One more	 		4+1=5		add, more,and make, sum, total altogether score double one more, two more, ten more... how many more to make... ? one more, ten more add, addition, more, plus, increase sum, total, altogether double, near double
Combining two parts to make a whole: part	Use objects to add two numbers together	Use pictures to add two numbers together as a	Use the part-part whole model to move into the	Both the part part whole model and the bar model can	

<u>whole model</u>	    	group. 	abstract 4 + 3 = 7 10= 6 + 4  	be used to show/explain addition.   	how many more to make...? tens boundary, hundreds boundary units boundary, tenths boundary inverse Altogether both combined how many increase join plus together total
<u>Starting at the bigger number and counting on</u>	Start with the larger number of objects then count on the smaller number 1 by 1 using objects. 	Start at the larger number on the number line/track and count on in ones or in one jump to find the answer. 12+5=17 	Place the larger number in your head and count on the smaller number to find your answer. 5+12=17		

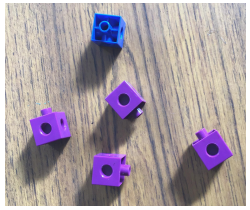
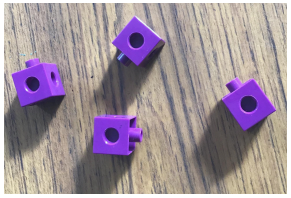
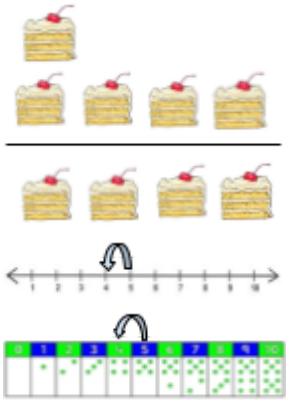
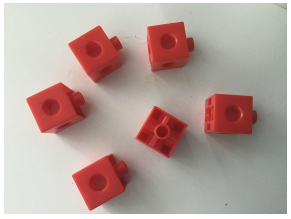
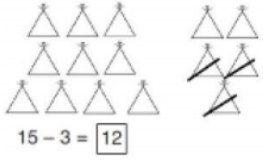
					
Use number facts	  			  	
Regrouping to	Start with the	Use pictures or a	7+4=11		

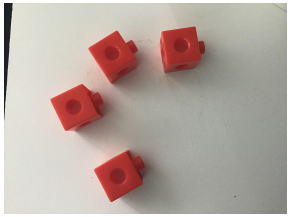
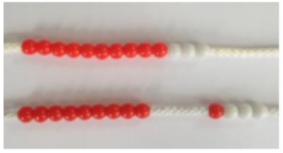
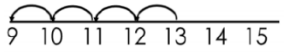
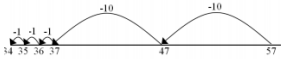
<u>make 10</u>	bigger number and use the smaller number to make 10.  6 + 5 = 11 	number line. Regroup or partition the smaller number to make 10.  3 + 9 =  	If I am at 7, how many more do I need to make 10. How many more do I add on now?		
<u>Adding three single digits</u>	4+7+6=17 Put 4 and 6 together to make 10. Add on 7.  Following on from making 10, make 10 with two 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.  	 	
<u>Column method-</u>	24+15=	After practically	Column		

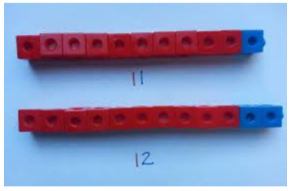
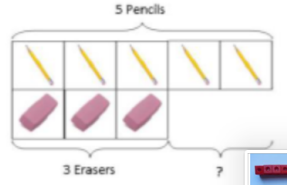
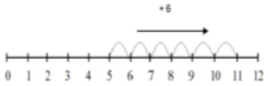
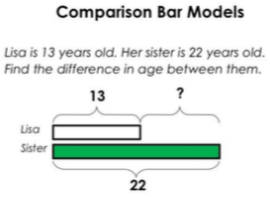
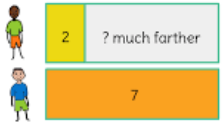
<u>no regrouping</u>	Add together the ones first then add the tens. Use Base 10 blocks first before moving onto place value counters.  	using the base 10 blocks and place value counters, children can draw the counters to help them to solve additions.  	method-formal written 21+42= 		
<u>Column method- regrouping</u>	Make both numbers on a place value grid.  Add up the units and exchange 10 ones for one ten.	Children can draw a pictorial representation of the columns and place value counters to further support their learning and understanding.	Start by partitioning the numbers before moving on to clearly show the exchange below the addition. 20 + 5 <u>40 + 8</u> 60 + 13 = 73		

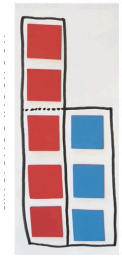
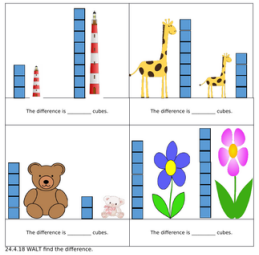
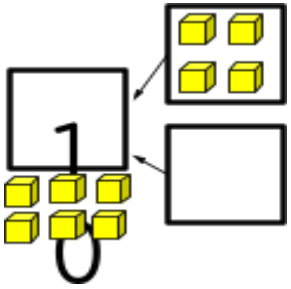
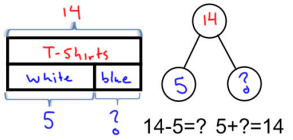
	 Add the rest of the columns exchanging the 10 counters from one column until every column has been added. This can also be done with Base 10 to help children clearfly see that 10 ones equal 1 ten and 10 equal 100. As children move onto decimals, money and decimal place value counters can be used to support learning.		536 + 85 621 1 1 As the children move on, introduce decimals with the same number of decimal places and different. Money can be used here. 72.8 + 54.6 127.4 1 1 £ 2 3 . 5 9 + £ 7 . 5 5 £ 3 1 . 1 4 1 1 1 2 3 . 3 6 1 9 . 0 8 0 5 9 . 7 7 0 + 1 . 3 0 0 9 3 . 5 1 1 2 1 2		

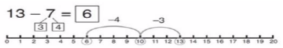
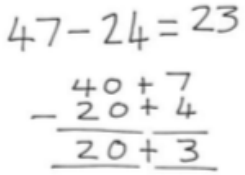
Subtraction

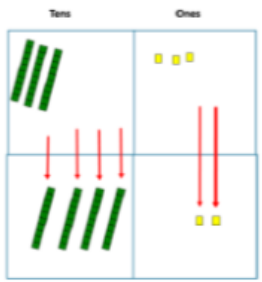
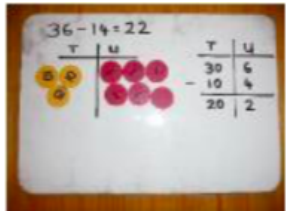
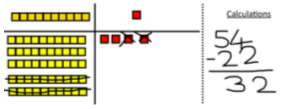
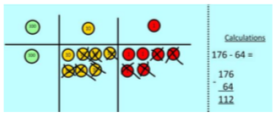
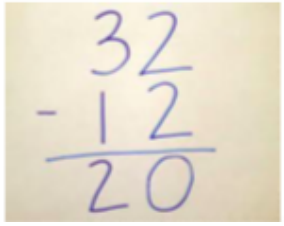
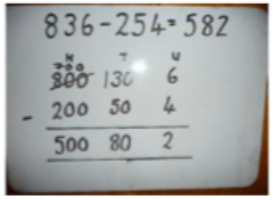
Objective/ Strategy	Concrete	Pictorial	Abstract	Models	Vocab
One less	 		5-1=4		subtract, subtraction, take (away), minus, decrease leave, how many are left/left over? difference between half, halve how many more/fewer is... than...? how much more/less is...? equals, sign, is the same as tens boundary, hundreds boundary units boundary, tenths boundary inverse
Taking in ones	Use physical objects, counters, cubes, playdough etc. To show how objects can be taken away. 6-2=4 	Cross out drawn objects to show what has been taken away. 	18 -3= 15 8 – 2 = 6		

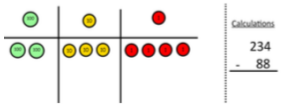
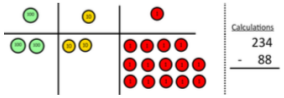
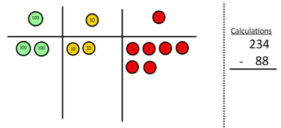
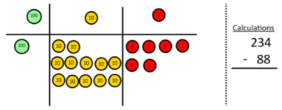
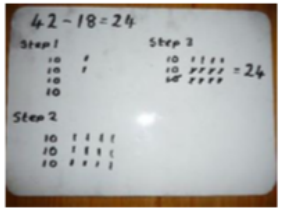
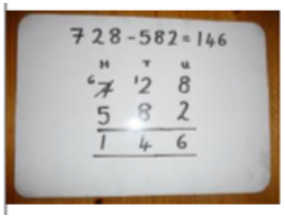
					
Counting back	Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones. 13 – 4  Use counters and move them away from the group as you take them away counting backwards as you go.	Count back on a number line or number track.  Start at the bigger number and count back the smaller number showing the jumps on the number line.  This can progress all the way to counting back using two 2 digit numbers.	Put 13 in your head, count back 4. What number are you at? Use your fingers to help. 		

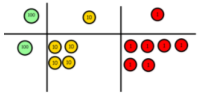
					
<u>Find the difference</u>	Compare amounts and objects to find the difference. Use cubes to build towers or make bars to find the difference.   Use basic bar models with items to find the difference.	Count on to find the difference.  Draw bars to find the difference between 2 numbers.  	Hannah has 23 sandwiches, Helen has 15 sandwiches. Find the difference between the number of sandwiches.	 	

	 				
Part Part Whole Model	Link to addition- use the part whole model to help explain the inverse between addition and subtraction. 			 14-5=? 5+?=14	

	If 10 is the whole and 6 is one of the parts. What is the other part? 10 - 6 =				
<u>Make 10</u>	14 – 9 =  Make 14 on the ten frame. Take away the four first to make 10 and then take away one more so you have taken away 5. You are left with the answer of 9.	 Start at 13. Take away 3 to reach 10. Then take away the remaining 4 so you have taken away 7 altogether. You have reached your answer.	16 – 8= How many do we take off to reach the next 10? How many do we have left to take off?		
<u>Column Method without regrouping</u>	Use Base 10 to make the bigger number then take the smaller number away.	Draw the Base 10 or place value counters alongside the written calculation to help to show working.	 This will lead to a clear written column subtraction.		

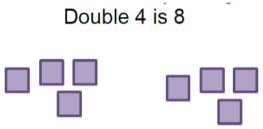
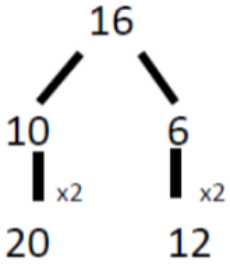
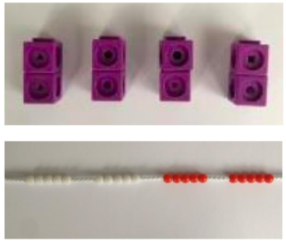
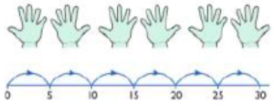
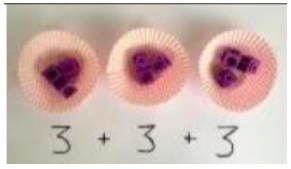
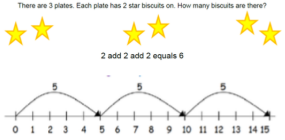
	 Show how you partition numbers to subtract. Again make the larger number first. 	 			
<u>Column Method with regrouping</u>	Use Base 10 to start with before moving on to place value counters. Start with one exchange before moving onto subtractions with 2 exchanges. Make the larger number with the	Draw 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.	Children can start their formal written method by partitioning the number into clear place value columns. 		

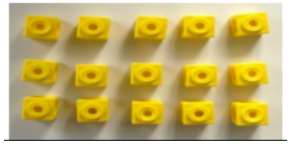
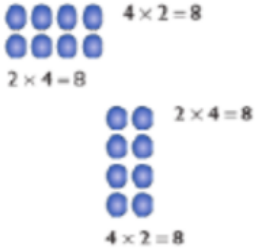
	place value counters  Start with the ones, can I take away 8 from 4 easily? I need to exchange one of my tens for ten ones.  Now I can subtract my ones.  Now look at the tens, can I take away 8 tens easily? I need to exchange one hundred for ten tens.  Now I can take	 When confident, children can find their own way to record the exchange/ regrouping. Just writing the numbers as shown here shows that the child understands the method and knows when to exchange/ regroup.  	Moving forward the children use a more compact method.  This will lead to an understanding of subtracting any number including decimals. 5 12 1 2 6 3 . 0 - 2 6 . 5 2 3 6 . 5		

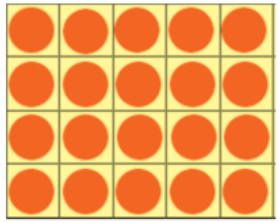
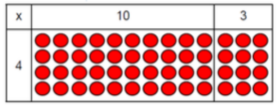
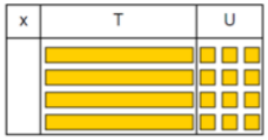
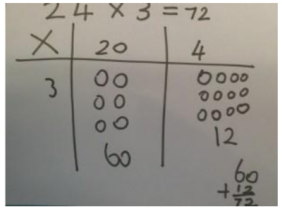
	away eight tens and complete my subtraction.   Show children how the concrete method links to the written method alongside your working. Cross out the numbers when exchanging and show where we write our new amount.				

Multiplication

Objective/ Strategy	Concrete	Pictorial	Abstract	Models	Vocab
Doubling	Use practical activities to show	Draw pictures to show how to	Partition a number and		lots of, groups of

	how to double a number.  	double a number.  	then double each part before recombining it back together.  		times, multiply, multiplication, multiplied by multiple of, product once, twice, three times... ten times... times as (big, long, wide... and so on) repeated addition array, row, column double, halve
<u>Counting in multiples</u>	Count in multiples supported by concrete objects in equal groups. 	Use a number line or pictures to continue support in counting in multiples. 	Count in multiples of a number aloud. Write sequences with multiples of numbers. 2, 4, 6, 8, 10 5, 10, 15, 20, 25 , 30		
<u>Repeated addition</u>	Use different objects to add equal groups.  	 5+5+5=15	Write addition sentences to describe objects and pictures.  		

	 		Move onto the equivalence between repeated addition and multiplication. 2+2+2=6 is the same as 2x3=6		
<u>Arrays-showing commutative multiplication</u>	Create arrays using counters/ cubes to show multiplication sentences.  	Draw arrays in different rotations to find commutative multiplication sentences.  Link arrays to area of rectangles.	Use an array to write multiplication sentences and reinforce repeated addition.  5+5+5=15 3+3+3+3+3=15 5x3=15 3x5=15		

					
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	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. | ×	30	5
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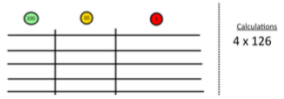
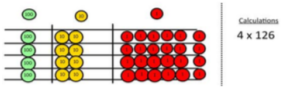
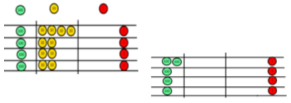
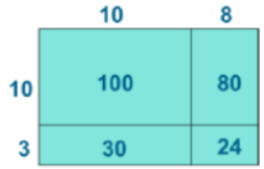
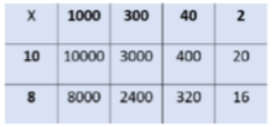
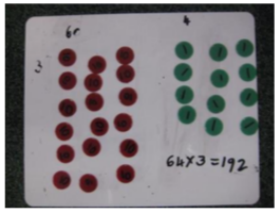
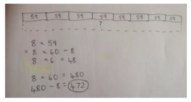
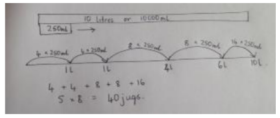
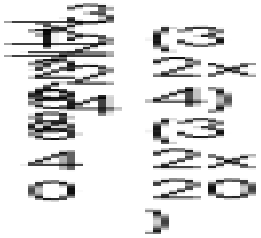
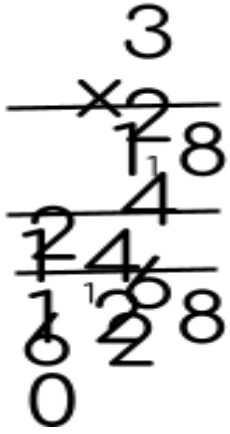
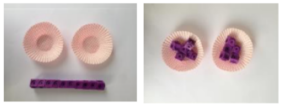
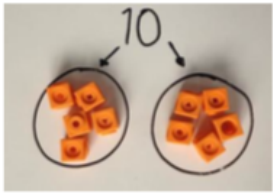
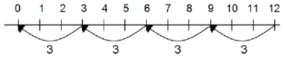
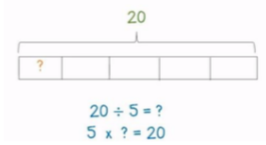
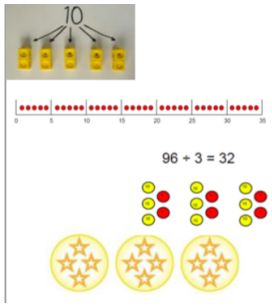
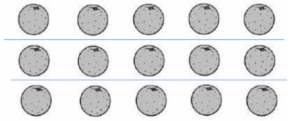
7	210	35	 210 + 35 = 245 Moving forward, multiply by a 2 digit number showing the different rows within the grid method.		

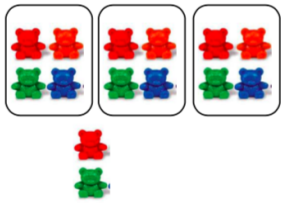
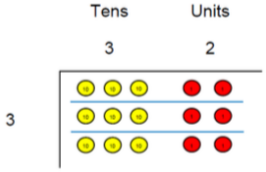
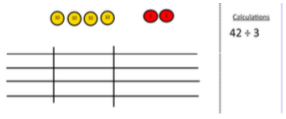
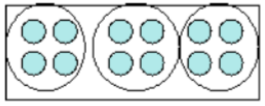
	multiplying by 4 so we need 4 rows.  Fill each row with 126.  Add up each column, starting with the ones making any exchanges needed.  Then you have your answer.		  		
<u>Column multiplication</u>	Children can continue to be supported by place value counters at the stage of multiplication.	Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written	Start with long multiplication, reminding the children about lining up their numbers clearly in columns. Children write out		

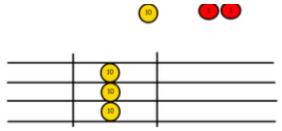
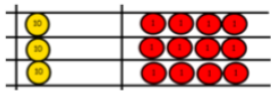
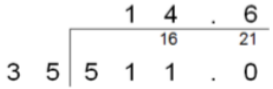
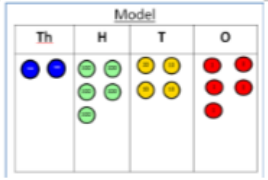
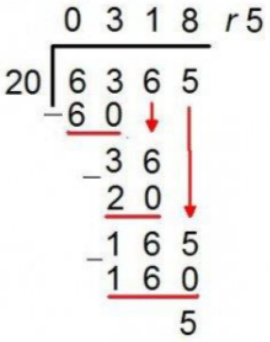
	 It is important at this stage that they always multiply the ones first and note down their answer followed by the tens which they note below.	methods.  	what they are solving next to their answer.  This moves to a more compact method and can involve carrying. 		

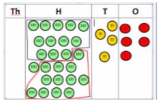
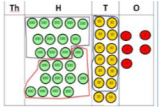
Division

Objective/ Strategy	Concrete	Pictorial	Abstract	Models	Vocab
Sharing into groups	I have 10 cubes, can you share them equally in 2 groups?  	Children use pictures or shapes to share quantities.  8 ÷ 2 = 4	Share 9 buns between three people. 9 ÷ 3= 3		share, share equally one each, two each, three each... group in pairs, threes... tens equal groups of divide, division, divided by, divided into remainder factor, quotient, divisible by inverse
Division as grouping	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.	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	28 ÷ 7 = 4 Divide 28 into 7 groups. How many are in each group?		

		many would be within each group.			
<u>Division within arrays</u>	Link division to multiplication by creating 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		
<u>Division with a remainder</u>	14 ÷ 3 = Divide objects between groups and see how much is left over	Jump forward in equal jumps on a number line then see how many more you need to jump to find a	Complete written divisions and show the remainder using r.		

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

	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.				
<u>Long division</u>	2544 ÷ 12 How many groups of 12 thousands do we have? None  Exchange 2 thousand for 20 hundreds.	Instead of using physical counters, students can draw the counters and circle the groups on a whiteboard or in their books. Use this method to explain what is happening and as soon as they have understood what move on to the			

	 $12\overline{)2544}$ 0 How many groups of 12 are in 25 hundreds? 2 groups. Circle them. We have grouped 24 hundreds so can take them off and we are left with one.  $12\overline{)2544}$ $0\,2$ 24 1 Exchange the one hundred for ten tens so now we have 14 tens. How many groups of 12 are in 14? 1 remainder 2  $12\overline{)2544}$ $0\,2\,1$ 24 14 12 2 Exchange the two tens for twenty ones so now we have 24 ones. How many groups of 12	abstract method as this can be a time consuming process.			

	are in 24? 2				