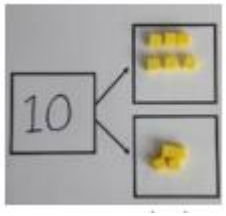
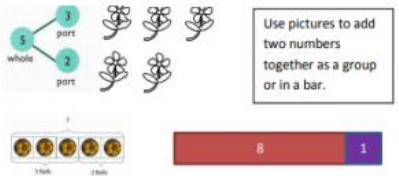
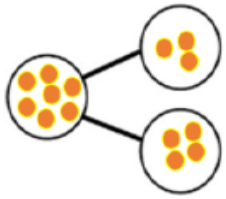
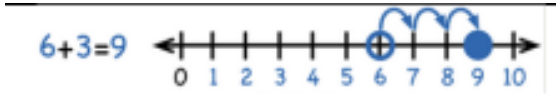
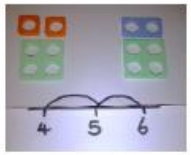
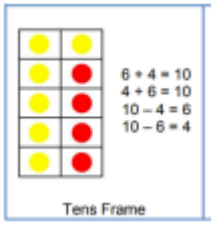
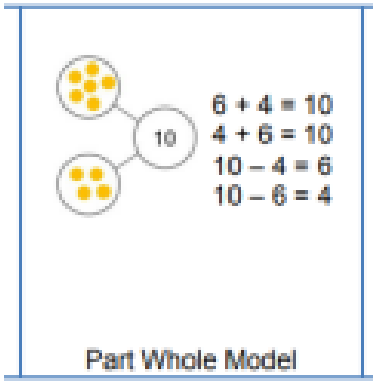
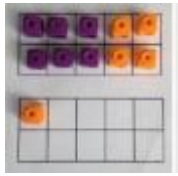
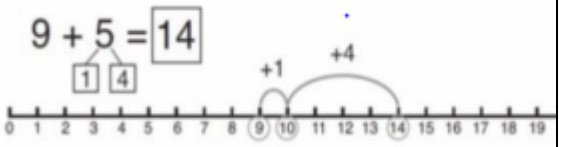
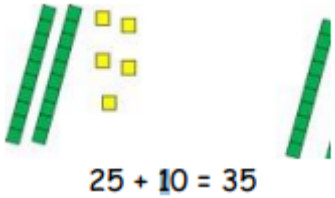
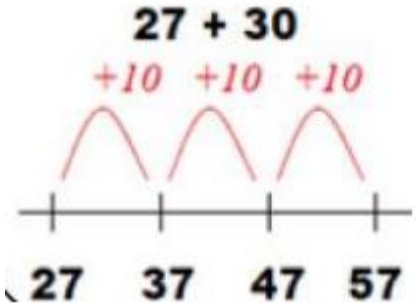
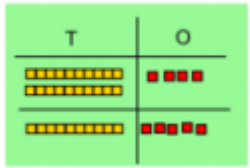
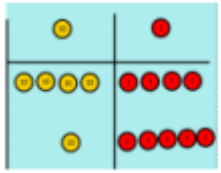
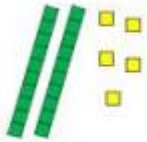
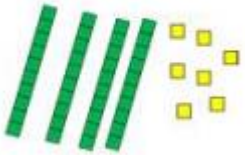
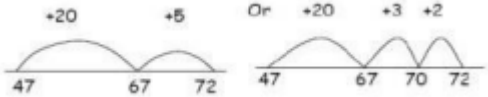
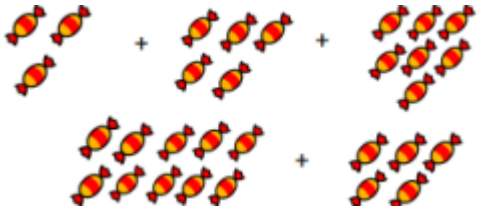
Ormiston Meadows Academy Calculation Policy

Addition			
	Concrete	**Pictorial**	**Abstract**
Combining two parts to make whole: part-whole model	Use part part-whole model. Use cubes to add two numbers together as a group.  	Use pictures to add two numbers together as a group or in a bar.  	Use the part part-whole diagram. 
Starting at the bigger number and counting on, including adding a 2-digit	Start with the larger number on the bead string and then count on to the smaller number. 	Start at the larger number on the number line and count on in ones or in one jump to find the answer. 	Place the larger number in your head and count on the small number to find your answer.

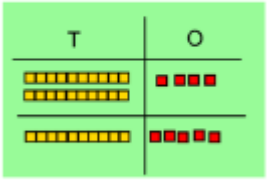
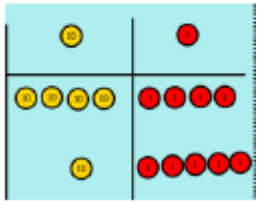
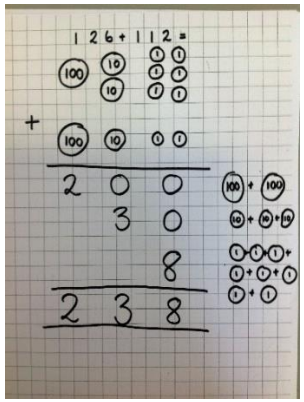
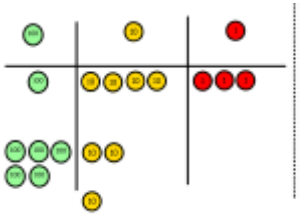
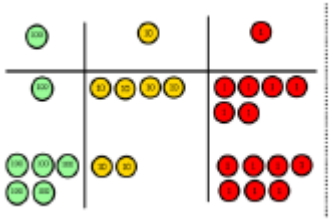
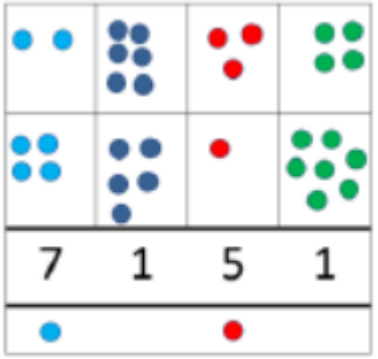
Ormiston Meadows Academy Calculation Policy

number and ones	**Counting on using number lines** by using cubes or numicon  		
Represent and use number bonds and us related subtraction facts within 20	Some children may need to initially use real objects before moving onto the representations  .		Part-whole model to be used alongside abstract.
Regrouping to make 10 *This is an essential skill for column addition later on*	Start with the bigger number and use the smaller number to make 10. Use ten frames. 6 + 5 = 	Use pictures or a number line. Regroup or partition the smaller number using the part part-whole model to make 10. 	Part-whole model to be used alongside abstract.
Add a 2 digit	Explore that the ones digit does not change.	Dienes may be used, as well as a number line.	Focusing on the place value column, children add that amount of tens.

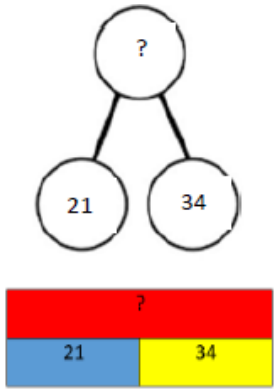
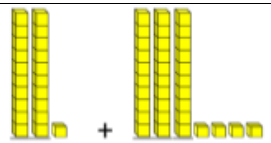
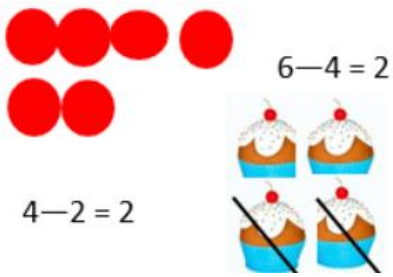
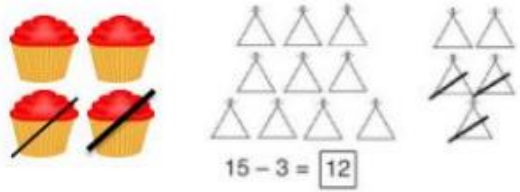
Ormiston Meadows Academy Calculation Policy

number and tens			Children should be able to mentally add a ten to a number.
Add two 2 digit numbers	Model using dienes and place value counters.    	Use a number line and bridge ten using part-whole if necessary. 	Partition the number into columns to support the place value in preparation for formal written methods. Children should be able to mentally add each part in their head. 47 + 35 40 + 7 30 + 5 70 + 12
Add three 1 digit numbers	Combine to make 10 first if possible, or if possible then add third digit. 	Regroup and draw representations. 	Combine the two numbers that make/ bridge ten, then add on the third. 4 + 7 + 6 = 10 + 7 10 = 17

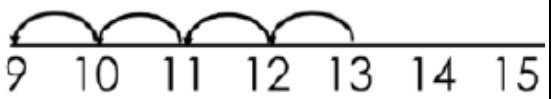
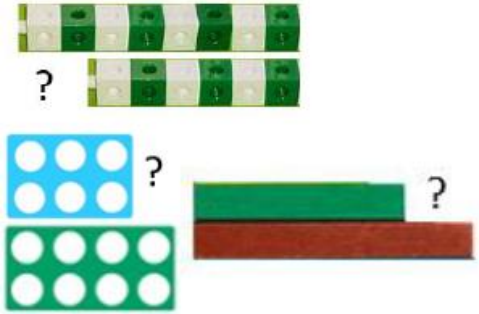
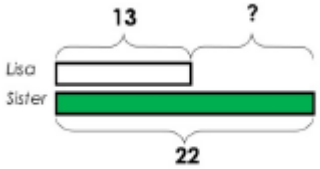
Ormiston Meadows Academy Calculation Policy

Column addition, formal method – no exchanging	Model using dienes or place value counters. 24 + 15= Add together the ones first then add the tens. Use the Base 10 blocks first before moving onto place value counters.  	Children move onto drawing the counters.  	Calculations 21 + 42 = 21 + 42
Column addition, formal method - exchanging	Make both numbers on a place value grid.  146 + 527 Add up the units and exchange 10 ones for one 10.  146 + 527 Add up the rest of the columns,	Children can draw a pictorial representations of the columns and place value counts to further support their learning and understanding.  	2 2 3 + 1 1 4 3 3 7

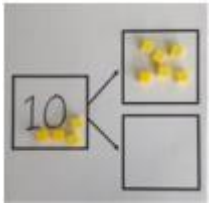
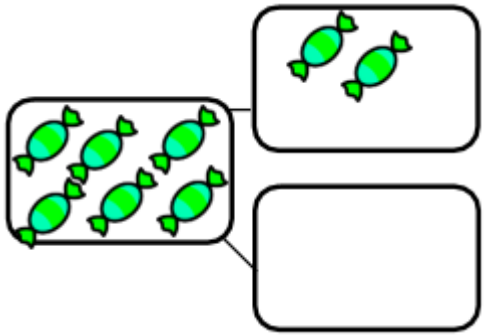
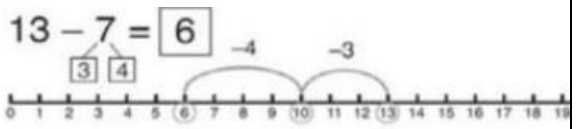
Ormiston Meadows Academy Calculation Policy

	exchanging the 10 counters from one column for the next place value column until every column has been added.		
Fluency variations, different ways to ask the children to solve 21 + 34			
	Sam saved £21 one week and £34 another. How much did he save in total? 21+34=55. Prove it! (reasoning but the children need to be fluent in representing this)	21 +34 ____ 21 + 34 = = 21 + 34 What's the sum of twenty one and thirty four?	 Always use missing digit problems too: Tens / Ones ? / 4
Subtraction			
	Concrete	**Pictorial**	**Abstract**
Taking away ones *Subtract one-digit and two-digit numbers to 20, including 0*	Use physical objects, counters, cubes etc to show how objects can be taken away. 	Cross out objects to show what has been taken away. 	

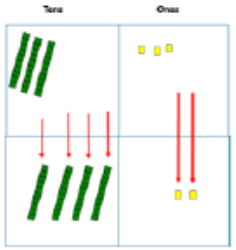
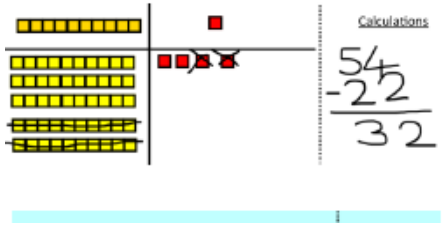
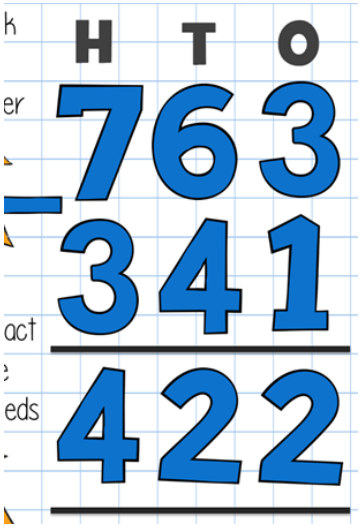
Ormiston Meadows Academy Calculation Policy

Counting back, including subtracting a one-digit number from a two-digit number	Move objects away from the group, counting backwards. Move the beads along the bead string as you count backwards. ones. 13 – 4  Use counters and move them away from the group as you take them away counting backwards as you go. 	Count back in ones using a number line.  	Put 12 in your head, count back 3. What number are you at? Use your fingers to help.
Find the difference	Using cubes or numicon.  	Draw bars to find the different between 2 numbers. Children to draw cubes/ objects they have used.  	

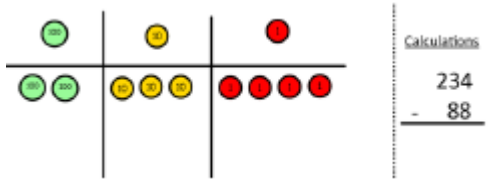
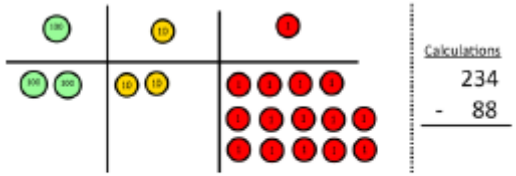
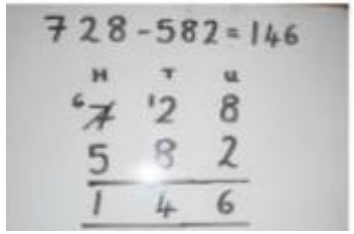
Ormiston Meadows Academy Calculation Policy

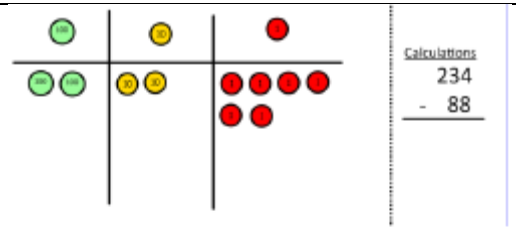
Represent and use number bonds and related facts within 20 *Part part-whole model*	Link to addition. Use the part part-whole model for the inverse. 	Use a pictorial representation of objects to show the part part-whole model. 	Move to using numbers within the part part-whole model. 
Make 10	Make the number on the ten frame. 14 – 9 Make 14 on the ten frame. Take away the four first to make 10 and then takeaway one more so you have taken away 5. You are left with the answer of 9. 	13 – 7 Start at 13. Take away 3 to reach 10. Then take away the remaining 4 so you have taken away 7 altogether. 	18 – 6 How many do we take off to read the next 10? How many do we have left to take off?
Subtract a 2 digit	Explore that the ones digit does not change.	Dienes may be used, as well as a number line.	Focusing on the place value column, children subtract that amount of tens.

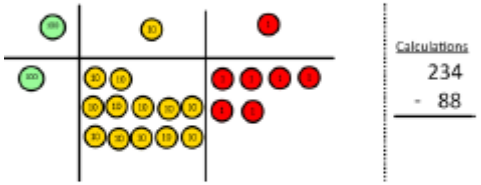
Ormiston Meadows Academy Calculation Policy

number and tens			Children should be able to mentally subtract a ten from a two-digit number.
Subtract two 2 digit numbers, no exchange.	Model using dienes and place value counters.	Use a number line and bridge ten using part-whole if necessary.	Partition the number into columns to support the place value in preparation for formal written methods. Children should be able to subtract 2 two-digit numbers mentally.
Column subtraction, formal method – no exchanging	Use dienes to make the bigger number and then take the smaller number away. Show how you partition numbers to subtract. 	Draw the dienes or place value counters alongside the written calculation to help to show working. 	

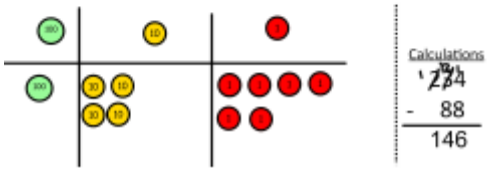
Ormiston Meadows Academy Calculation Policy

Column subtraction, formal method - exchanging	Use dienes to start with before moving onto place value counters. Start with one exchange before moving onto subtractions with 2 exchanges. Start with the ones, can I take away 8 from 4  Calculations 234 - 88 easily? I need to exchange and replace one of my tens for ten ones.  Calculations 234 - 88 Now I can subtract my ones. Now look at the tens, can I take away 8 tens easily? I need to exchange and replace one hundred for ten tens.	When confidence, children can find their own way to record the exchange.	Children can start the formal written method. 





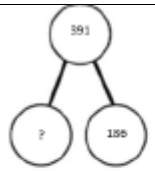
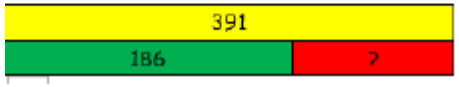
Now I can take away eight tens and complete my subtraction

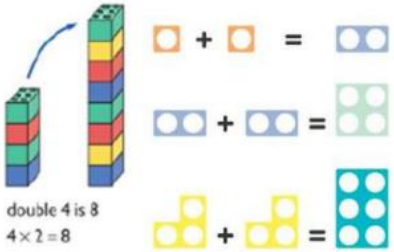
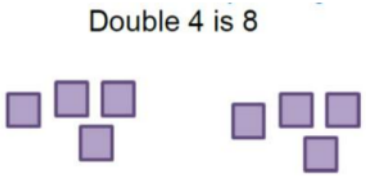
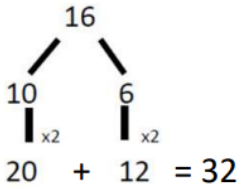


Show children how the concrete method links to the written method alongside your working. Cross out the numbers when exchanging and replacing and show where we write our new amount.

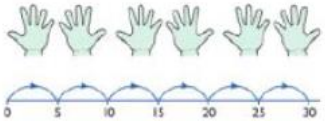
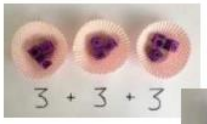
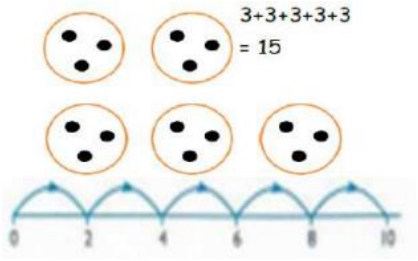
Fluency variation, different ways to ask children to solve 391 - 186

Ormiston Meadows Academy Calculation Policy

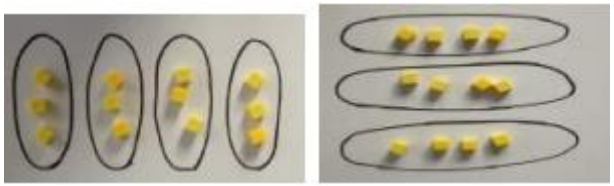
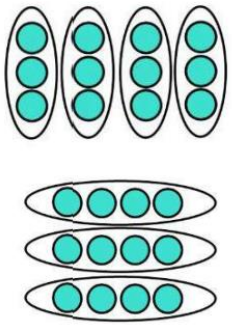
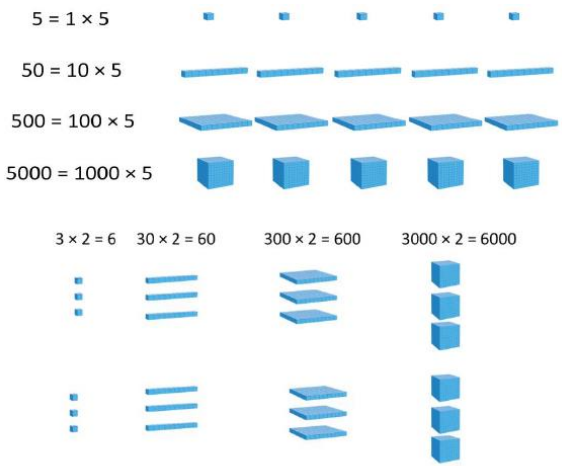
 	Raj spent £391, Timmy spent £186. How much more did Raj spend? I had 391 metres to run. After 186 I stopped. How many metres do I have left to run?	391 - 186 ☐ = 391 - 186 391 -186 ___ Find the difference ebtween 391 and 186 Subtract 186 from 391. What is 186 less than 391?	

Multiplication			
	Concrete	**Pictorial**	**Abstract**
Doubling	Use practical activities to show how to double a number. 	Draw pictures to show how to double a number. 	Partition a number and then double each part before recombining it back together. 

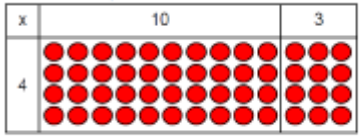
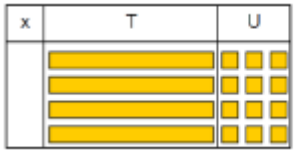
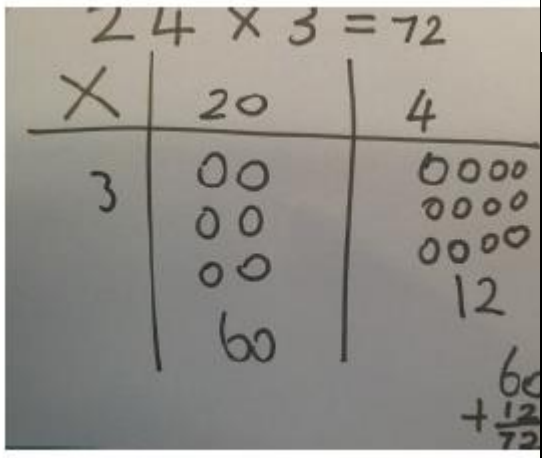
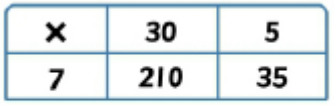
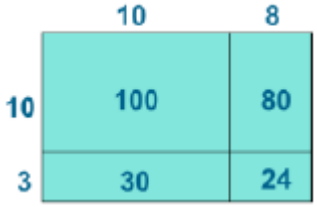
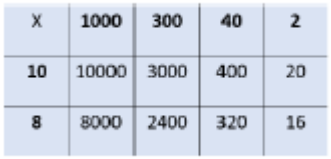
Ormiston Meadows Academy Calculation Policy

Counting in multiples	Count the groups as children are skip counting, children may use their fingers as they are skip counting.  	Children make representations to show counting in multiples.  Use a number line or pictures to continue support in counting in multiples.	Count in multiples of a number aloud. 2, 4, 6, 8, 10 5, 10, 15, 20, 25
Repeated addition	Use difference objects to add equal groups.   	Use pictorial representations, including a number line.  	Write addition sentences to describe objects and pictures. 

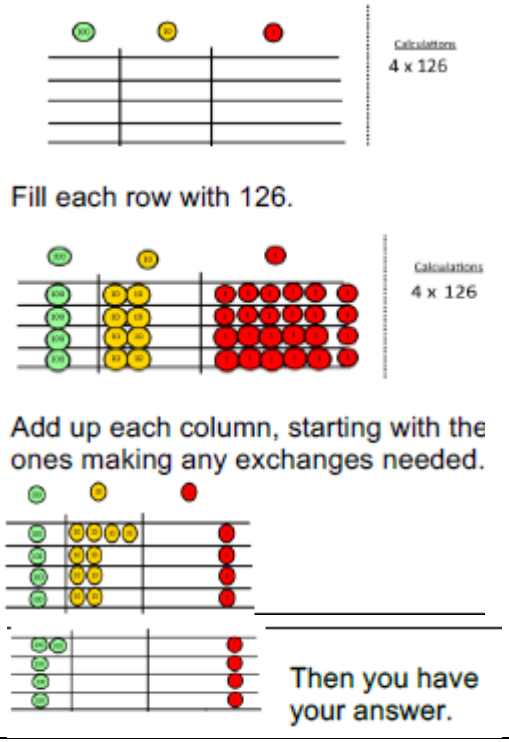
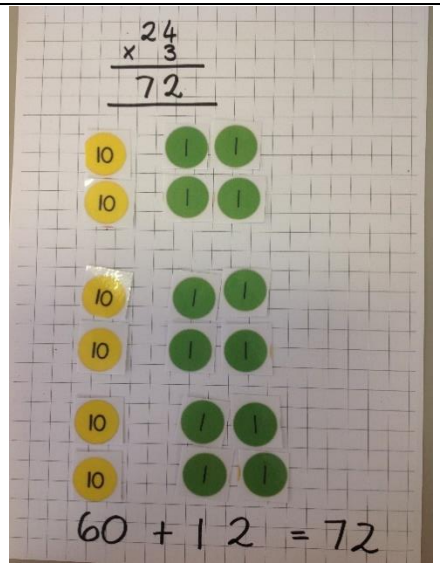
Ormiston Meadows Academy Calculation Policy

Arrays – showing multiplication is commutative	Create arrays using counters, cubes and numicon. Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer. 	Use representations of arrays to show different calculations and explore commutativity. 	Use an array to write multiplication sentences and reinforce repeated addition.  5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15 5 x 3 = 15 3 x 5 = 15
Using known facts for multiplying multiples of 10, 100 and 1000.			

Ormiston Meadows Academy Calculation Policy

Grid method	show the link with arrays first to introduce the grid method  4 rows of 10 4 rows of 3 Move onto using Base 10 to move towards a more compare method.  4 rows of 13 Move onto place value counters to show how we are finding groups of a numbers.	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 circles in different columns to show their thinking.  	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.  

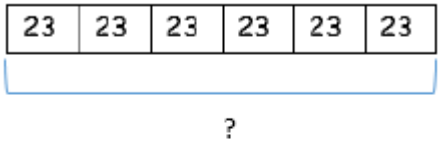
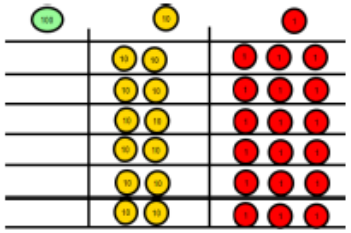
Ormiston Meadows Academy Calculation Policy

Short column multiplication			Children to record what it is they are doing to show understanding. 3 x 23 20 3 3 x 20 = 60 3 x 3 = 9 60 + 9= 69 23 x 3 69
Long column multiplication			Start with long multiplication, reminding the children about lining up their numbers clearly in columns.

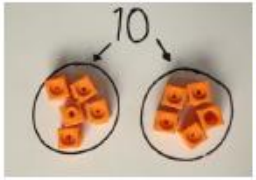
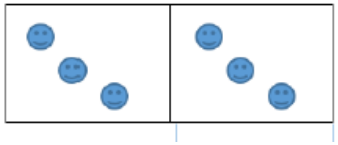
Ormiston Meadows Academy Calculation Policy

			32 x 24 8 (4 x 2) 120 (4 x 30) 40 (20 x 2) 600 (20 x 30) 768 This moves to the more compact method. 1342 x 18 13420 10736 24156
Fluency variation, different ways to ask children to solve23 x 6			

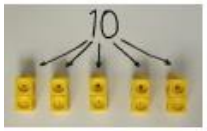
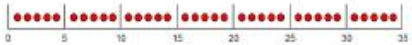
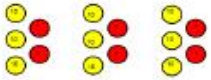
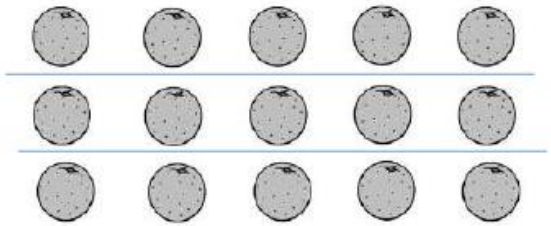
Ormiston Meadows Academy Calculation Policy

 With the counters, prove that 6 x 23 = 138 Why is 6 x 23 = 32 x 6?	Mai had to swim 23 lengths, 6 times a week. How many lengths did she swim in one week? Tom saved 23p three days a week. How much did he save in 2 weeks?	Find the product of 6 and 23 6 x 23 = ☐ = 6 x 23 6 × 23 = ___ 23 × 6 = ___	What's the calculation? What's th answer? 

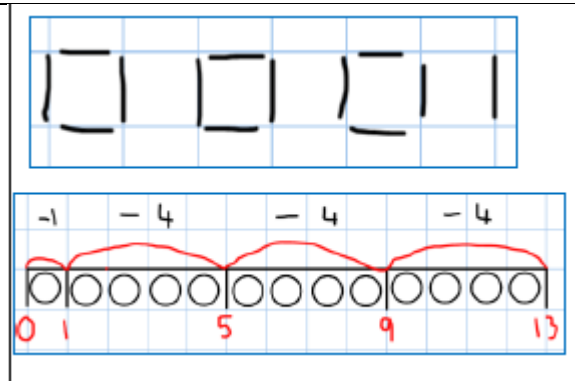
Division

	Concrete	Pictorial	Abstract
Division as sharing (sharing objects into group	   I have 10 cubes, can you share them equally in 2 groups?	 This can also be done in a bar so all 4 operations have a similar structure: 	6 ÷ 2 = 3 What's the calculation? 3 | 3
Division as grouping and repeated	Divide quantities into equal groups.		**28 ÷ 7 = 4** **Divide 28 into 7 groups. How many are in each group?**

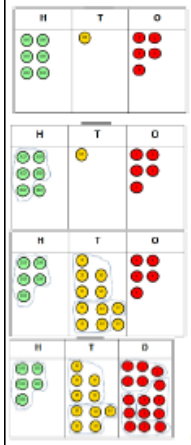
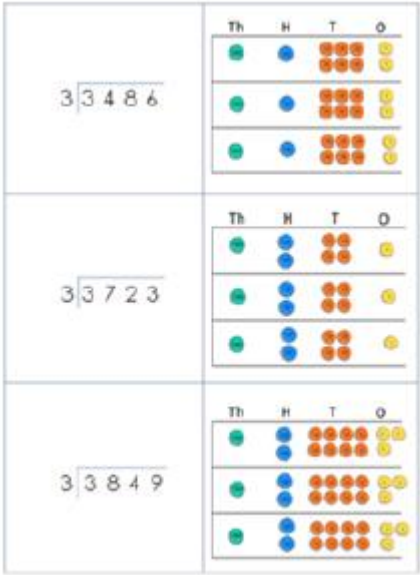
Ormiston Meadows Academy Calculation Policy

subtraction	  96 ÷ 3 = 32 		
Division with arrays including fact families and inverse	 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 group to make multiplication and division sentences.	

Ormiston Meadows Academy Calculation Policy

Division with a remainder			
Using known facts for dividing multiples of 10, 100 and 1000			

Ormiston Meadows Academy Calculation Policy

Short division	Use the ‘bus stop’ method using grouping and counters. 615 ÷ 5  Step 1: make 615 Step 2: Circle your groups of 5 Step 3: Exchange 1H for 10T and circle groups of 5 Step 4: exchange 1T for 10ones and circles groups of 5		$\begin{array}{r} 123 \\ 5\overline{)6^{1}1^{1}5} \end{array}$

Ormiston Meadows Academy Calculation Policy

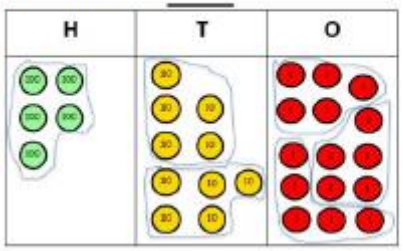
Long division

1. Divide.	2. Multiply & subtract.	3. Drop down the next digit.
t o 2 2) 5 8	t o 2 2) 5 8 - 4 1	t o 2 9 2) 5 8 - 4 ↓ 1 8
Two goes into 5 two times, or 5 tens ÷ 2 = 2 whole tens -- but there is a remainder!	To find it, multiply 2 × 2 = 4, write that 4 under the five, and subtract to find the remainder of 1 ten.	Next, drop down the 8 of the ones next to the leftover 1 ten. You combine the remainder ten with 8 ones, and get 18.

1. Divide.	2. Multiply & subtract.	3. Drop down the next digit.
t o 2 9 2) 5 8 - 4 1 8	t o 2 9 2) 5 8 - 4 1 8 - 1 8 0	t o 2 9 2) 5 8 - 4 1 8 - 1 8 0
Divide 2 into 18. Place 9 into the quotient.	Multiply 9 × 2 = 18, write that 18 under the 18, and subtract.	The division is over since there are no more digits in the dividend. The quotient is 29.

Fluency variation, different ways to ask children to solve 615 ÷ 5:

Ormiston Meadows Academy Calculation Policy

Using the part whole model below, how can you divide 615 by 5 without using the 'bus stop' method?  	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 How many 5's go into 615?	What's the calculation? What's the answer? ____ 

Ormiston Meadows Academy Calculation Policy