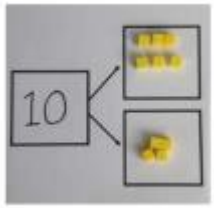
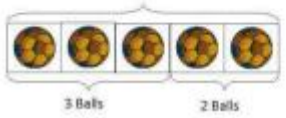
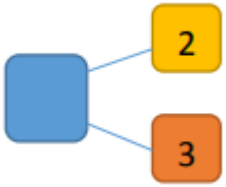
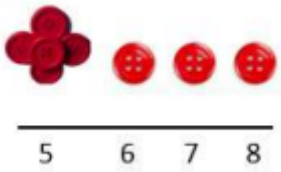
ST FRANCIS XAVIER
CATHOLIC PRIMARY
SCHOOL

Mathematics Calculation Policy

2024-2025

St Francis Xavier Catholic Primary School
Mathematics Calculation Policy 2024-2025

ADDITION

	Objective	Concrete	Pictorial	Abstract
Year 1	Number bonds of 5, 6, 7, 8, 9 and 10 Number bonds to 20	  Use cubes to add two numbers together as a group or in a bar. 	  Use pictures to add two numbers together as a group or in a bar.  	2 + 3 = 5 3 + 2 = 5 5 = 3 + 2 5 = 2 + 3  Use the part-part-whole diagram as shown above to move into the abstract.
Year 1 – Year 2	Counting	 Start with the larger number on the bead string (rekenrek) and then count on to the smaller number 1 by 1 to find the answer.  	Use a number line to count on in ones.  	5 + 3 = 8

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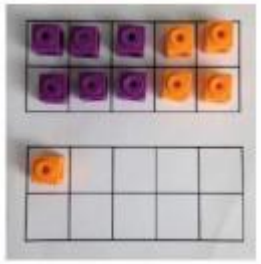
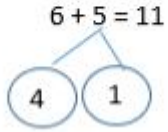
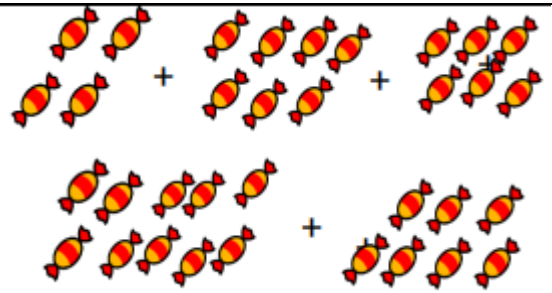
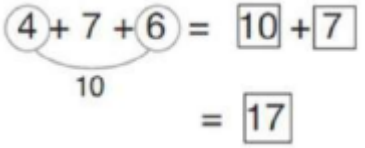
ADDITION

	Objective	Concrete	Pictorial	Abstract
Year 2	Regrouping to make 10	 6 + 5 = 11  Start with the bigger number and use the smaller number to make 10.	  6 + 4 = 10 10 + 1 = 11	6 + 5 = 11
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, look to see if you can make 10 with 2 of the digits then add on the third digit.	 Add together 3 groups of objects. Draw a picture to recombine the groups to make 10.	 Combine the two digits that make 10 and then add on the other digit.

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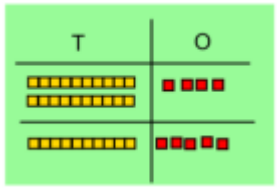
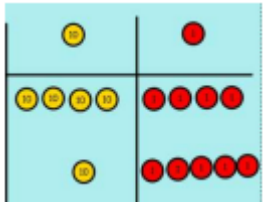
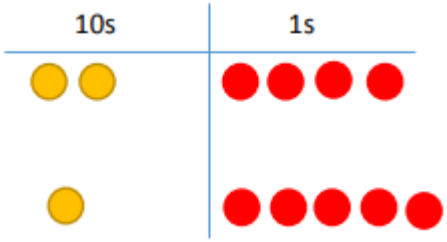
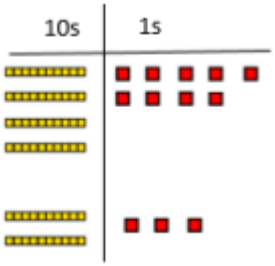
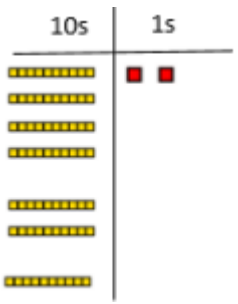
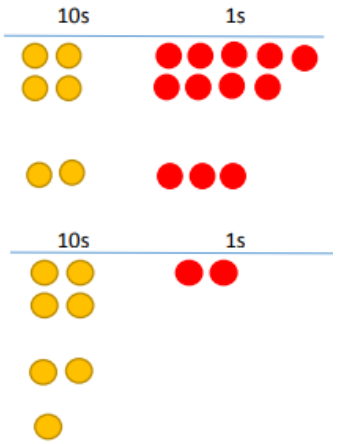
ADDITION

	Objective	Concrete	Pictorial	Abstract
Year 2	Column method without regrouping with numbers with up to 2 digits	Add together the ones first, then add the tens. Use the base 10 blocks first before moving onto place value counters. 24 + 15 =  44 + 15 = 	After physically using the base 10 blocks and place value counters, children can draw the counters to help them to solve additions..  	24 + 15 = 39 24 + 15 39
Year 3	Column method with regrouping with numbers with up to 3 digits	Make both numbers on a place value grid.  Add up the ones and exchange 10 ones for 1 ten.  	Using place value counters, children can draw the counters to help them solve the additions.  	40 + 9 20 + 3 60 + 12 = 72

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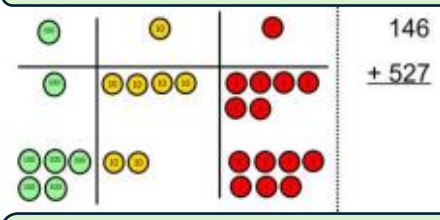
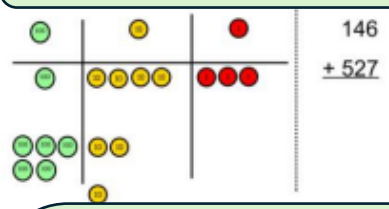
ADDITION

	Objective	Concrete	Pictorial	Abstract
Year 4 – Year 6	Column method with regrouping Y4- with numbers with up to 4-digits Y5/6- with numbers with more than 4 digits including decimals.	Make both numbers on a place value grid.  146 + 527 Add up the ones and exchange 10 ones for 1 ten.  146 + 527 Add up the rest of the columns, exchanging the 10 counters from one column for the next place value column until every column has been added. This can also be done with Base 10 to help children clearly see that 10 ones equal 1 ten and 10 tens equal 100. As children move on to decimals, money and decimal place value counters can be used to support learning. NB- By Year 4 children will progress on to adding four digit numbers using the same methods.	 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.	100 + 40 + 6 500 + 20 + 7 600 + 70 + 3 = 673 As the children progress, they will move from the expanded to the compacted method. 146 + 527 673 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 £23.59 + £7.55 £31.14 1 1 1 23.361 9.080 59.770 + 1.300 93.511 2 1 2

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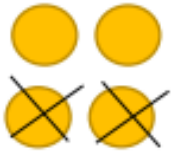
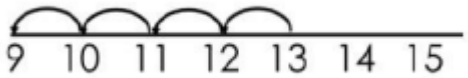
SUBTRACTION

	Objective	Concrete	Pictorial	Abstract
Year 1	Taking away ones	Use physical objects, counters, cubes etc. to show how objects can be taken away. 4 – 2 = 2 	Cross out drawn objects to show what has been taken away. 4 – 2 = 2 	4 – 2 = 2
Year 1 – Year 2	Counting back	Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones.  13 – 4 = 9	Count back on a number line or a number track.  Start at the bigger number and count back the smaller number, showing the jumps on the number line.	Put 13 in your head, count back 4. What number are you at? Use your fingers to help.

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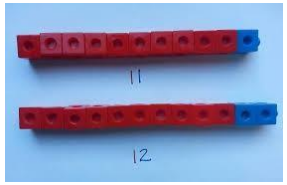
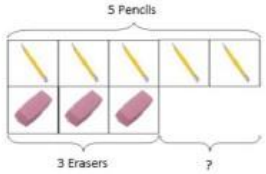
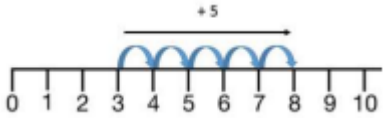
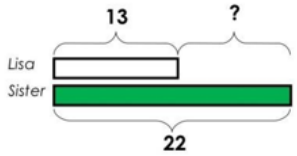
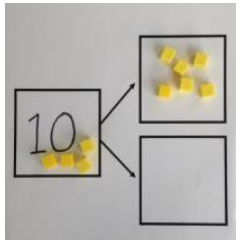
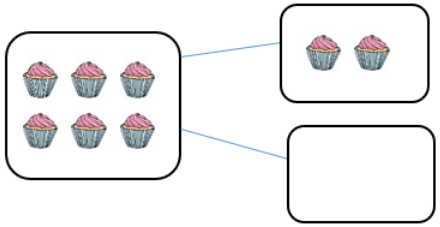
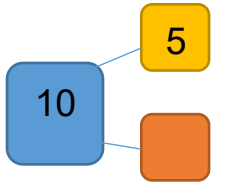
SUBTRACTION

	Objective	Concrete	Pictorial	Abstract
Year 1 – Year 2	Find the difference	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. **Comparison Bar Models** *Lisa is 13 years old. Her sister is 22 years old. Find the difference in age between them.*  Draw bars to find the difference between 2 numbers.	Hannah has 8 goldfish. Helen has 3 goldfish. Find the difference between the number of goldfish the girls have.
Year 1 – Year 2	Part- Part-Whole Model	 Link to addition- use the part whole model to help explain the inverse between addition and subtraction. If 10 is the whole and 6 is one of the parts. What is the other part? 10 - 6 =	Use a pictorial representation of objects to show the part-part-whole model. 	 Move to using numbers within the part whole model.

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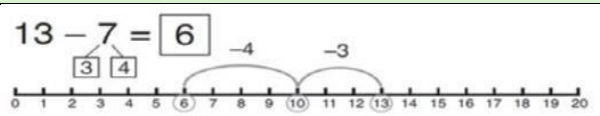
SUBTRACTION

	Objective	Concrete	Pictorial	Abstract
Year 1 – Year 2	Make 10	14 – 9 =  Make 14 on the ten frames. 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.	 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?

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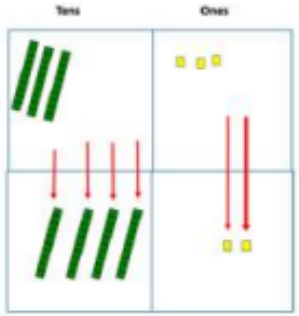
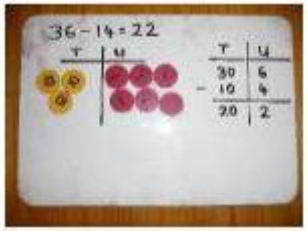
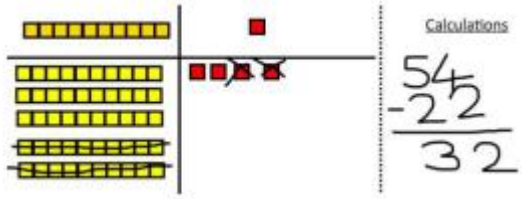
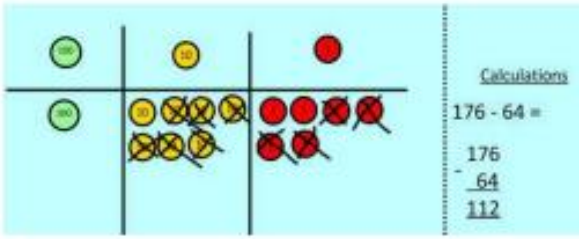
SUBTRACTION

	Objective	Concrete	Pictorial	Abstract
Year 2	Column method without regrouping with numbers with up to 2 digits	75 – 42 = 33  Use Base 10 to make the bigger number then take the smaller number away. Show how you partition numbers to subtract. Again 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. 

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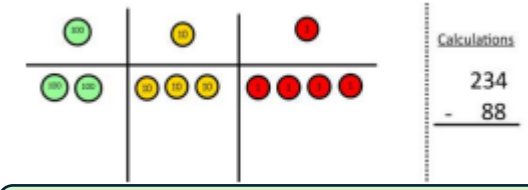
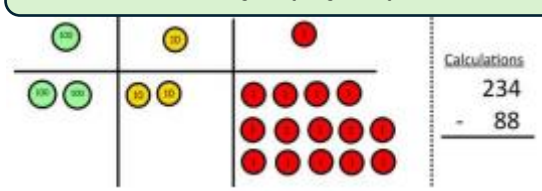
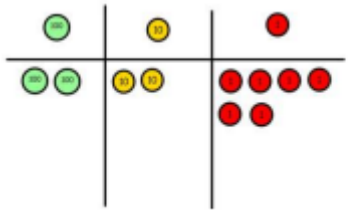
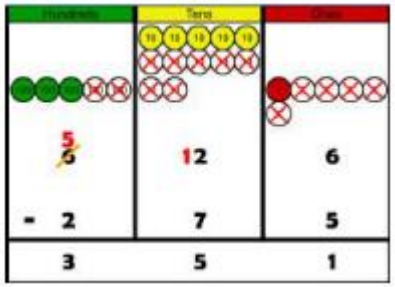
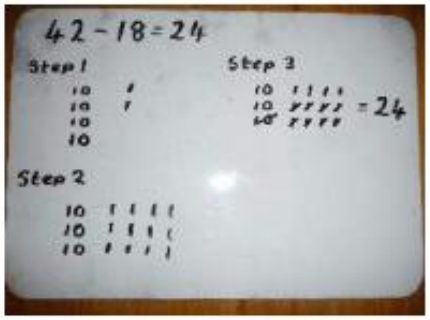
SUBTRACTION

	Objective	Concrete	Pictorial	Abstract
Year 3 – Year 6	Column method with regrouping Y3- with numbers with up to 3 digits Y4- with numbers with up to 4 digits Y5/6- with numbers with more than 4 digits including decimals	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	 Hundreds Tens Ones 5 12 6 - 2 7 5 3 5 1 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. 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.  42 - 18 = 24 Step 1 Step 2 Step 3 = 24	 836 - 254 = 582 800 130 6 - 200 50 4 500 80 2 Children can start their formal written method by partitioning the number into clear place value columns.  728 - 582 = 146 H T U 6 7 12 8 5 8 2 1 4 6 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

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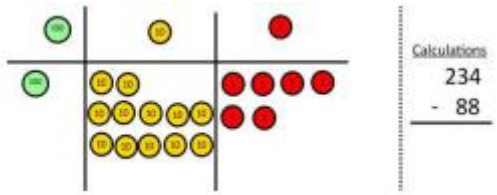
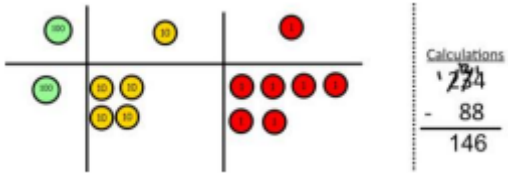
SUBTRACTION

	Objective	Concrete	Pictorial	Abstract
Year 3 – Year 6	Column method with regrouping (continued)	Now look at the tens, can I take away 8 tens easily? I need to exchange 1 hundred for 10 tens.  Now I can take away 8 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 to build up their understanding towards the abstract method.		

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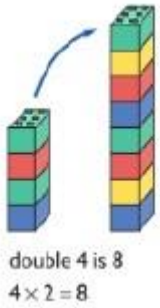
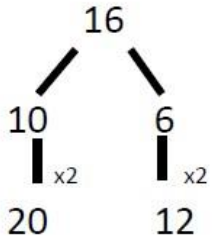
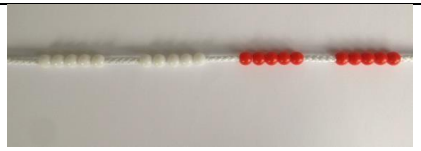
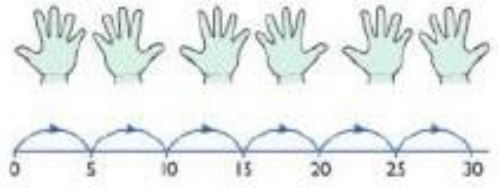
MULTIPLICATION

	Objective	Concrete	Pictorial	Abstract
Year 1	Doubling	 Use practical activities and concrete resources to show how to double a number.	Draw pictures to show how to double a number. Double 4 is 8 	 Partition a number and then double each part before recombining it back together.
Year 1	Counting in multiples	  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

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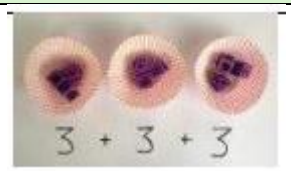
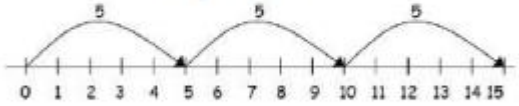
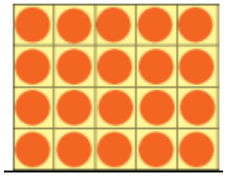
MULTIPLICATION

	Objective	Concrete	Pictorial	Abstract
Year 2 – Year 3	Repeated addition	   Use different objects to add equal groups.	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
Year 2 – Year 3	Arrays- showing commutative multiplication	Create arrays using counters/cubes to show multiplication sentences.  	Draw arrays in different rotations to find commutative multiplication sentences.  4 × 2 = 8 2 × 4 = 8  2 × 4 = 8 4 × 2 = 8  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 5 x 3 = 15 3 x 5 = 15

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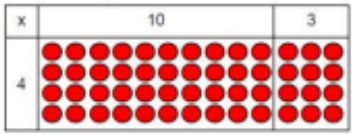
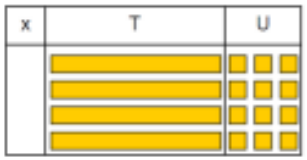
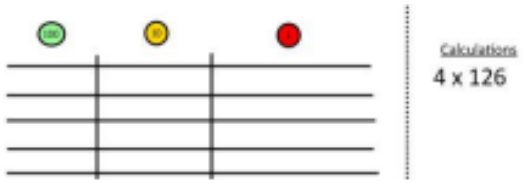
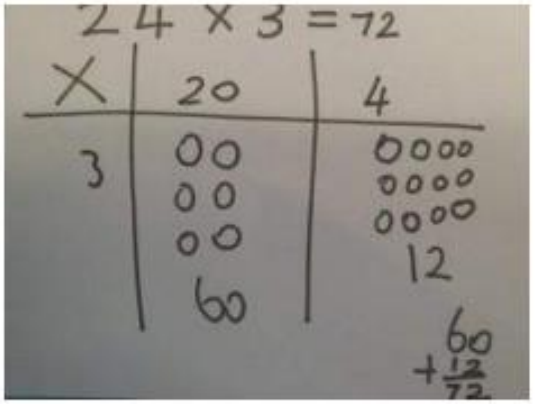
MULTIPLICATION

	Objective	Concrete	Pictorial	Abstract
Year 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.  	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 | | --- | --- | --- | | 7 | 210 | 35 | 210 + 35 = 245 Moving forward, multiply by a 2-digit number showing the different rows within the grid method. | | 10 | 8 | | --- | --- | --- | | 10 | 100 | 80 | | 3 | 30 | 24 | | X | 1000 | 300 | 40 | 2 | | --- | --- | --- | --- | --- | | 10 | 10000 | 3000 | 400 | 20 | | 8 | 8000 | 2400 | 320 | 16 |

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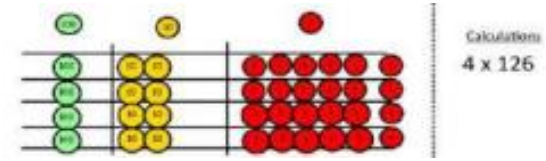
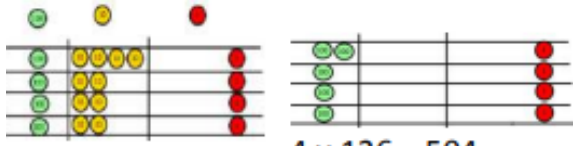
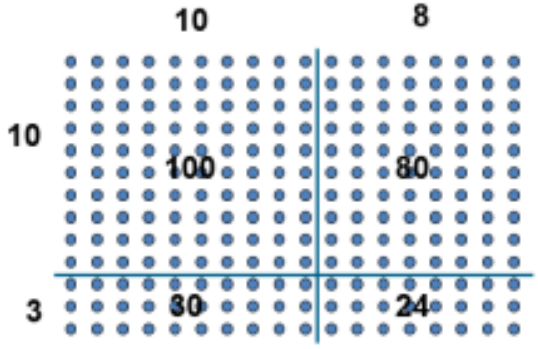
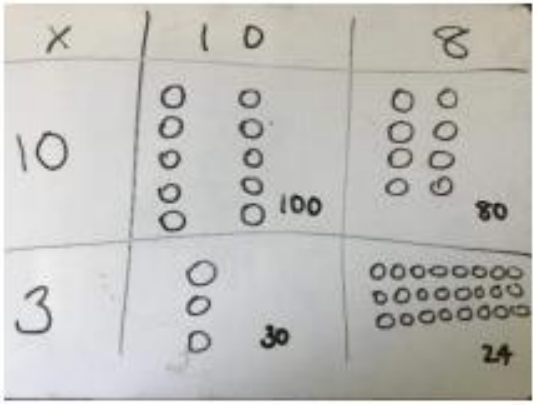
MULTIPLICATION

	Objective	Concrete	Pictorial	Abstract
Year 4	Grid Method (continued)	 Add up each column, starting with the ones making any exchanges needed.  4 × 126 = 504		
Year 5	Expanded Method	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

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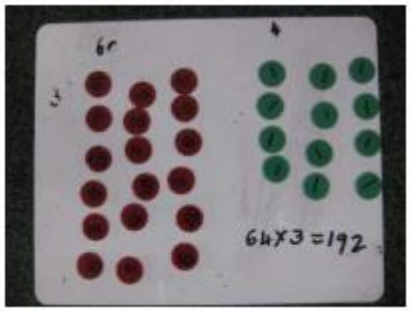
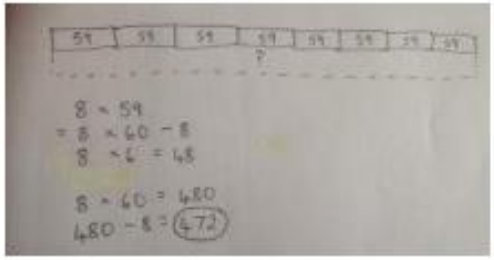
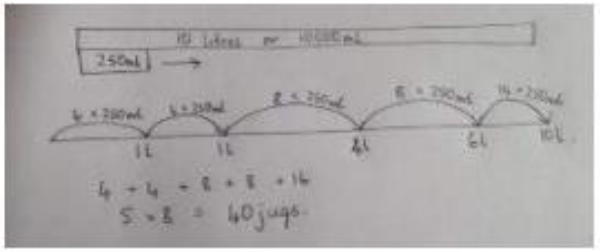
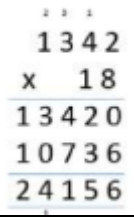
MULTIPLICATION

	Objective	Concrete	Pictorial	Abstract
Year 5 – Year 6	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.  This moves to the more compact method. 

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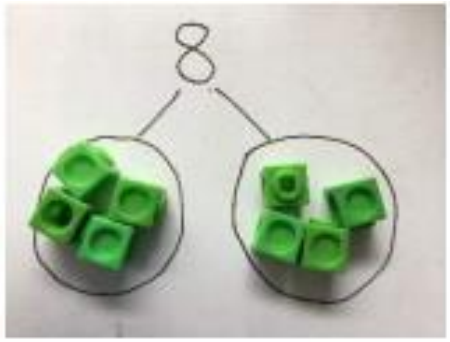
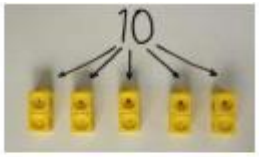
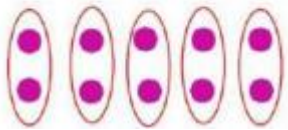
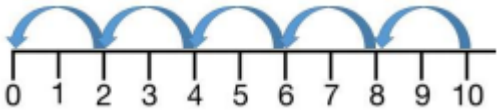
DIVISION

	Objective	Concrete	Pictorial	Abstract
Year 1 – Year 2	Sharing objects/ numbers into groups	I have 8 cubes; can you share them equally between two people? 	Children use pictures or shapes to share quantities.  8 ÷ 2 = 4	Share 8 buns between two people. 8 ÷ 2 = 4
Year 1 – Year 2	Division as Grouping (also for use when teaching fractions of amounts)	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 many would be within each group.  10 ÷ 5 = ? 5 x ? = 10	10 ÷ 5 = 2 Divide 10 into 5 groups. How many are in each group?

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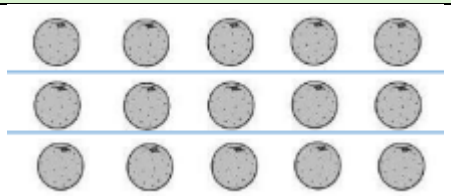
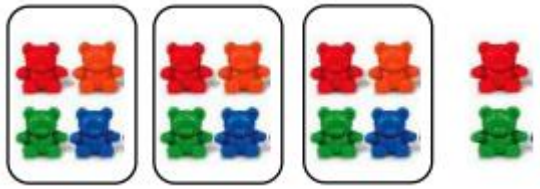
DIVISION

	Objective	Concrete	Pictorial	Abstract
Year 2 – Year 3	Division with arrays	Link division to multiplication by creating an array and thinking about the number sentences that can be created.  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. 5 x 3 = 15 3 x 5 = 15 15 ÷ 5 = 3 15 ÷ 3 = 5
Year 3 – Year 4	Division with remainders	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 remainder.  Draw dots and group them to divide an amount and clearlu show a remainder. 	Complete written divisions and show the remainder using r. 

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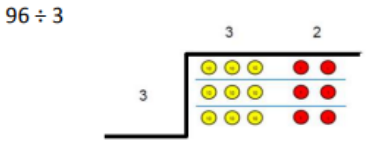
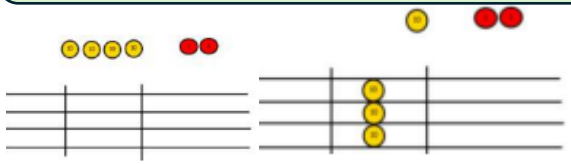
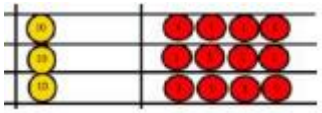
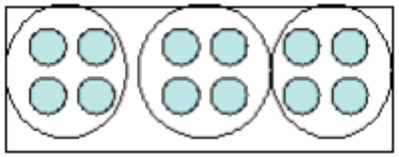
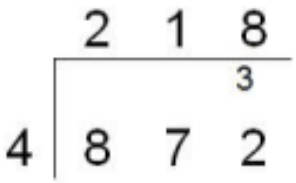
DIVISION

	Objective	Concrete	Pictorial	Abstract
Year 5 – Year 6	Short Division	Use place value counters to divide using the short division 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 10 ones and then share the ones equally among the groups. We look at how many are in each group. 	Children 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. 

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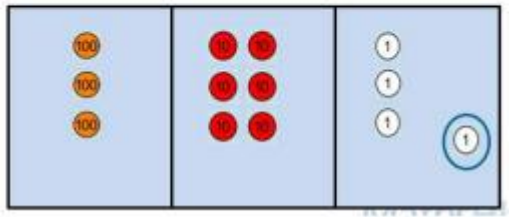
DIVISION

	Objective	Concrete	Pictorial	Abstract
Year 5 – Year 6	Short Division with remainders	364 ÷ 3 = 1 2 1 rem 1 3 | 3 6 4 		Move onto divisions with a remainder. Once children understand remainders, begin to express as a fraction or decimal according to the context. 8 6 r 2 3 5 | 4 3 2 1 8 6 1/5 5 | 9 ⁴3 ³1 1 4 . 6 16 21 3 5 | 5 1 1 . 0

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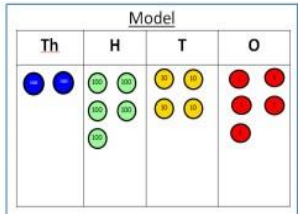
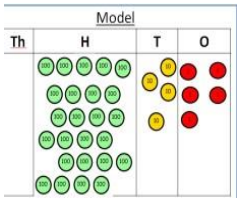
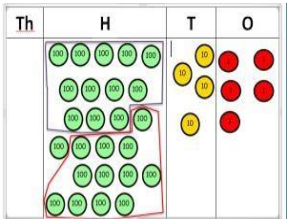
DIVISION

	Objective	Concrete	Pictorial	Abstract
Year 6	Long Division	 2544 ÷ 12 How many groups of 12 thousands do we have? Exchange 2 thousands for 20 hundreds  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. 	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 abstract method as this can be a time-consuming process.	Children will use long division to divide numbers with up to 4 digits by 2-digit numbers. 0 2 12) 2544 24 1 015 32) 487 -0 48 -32 167 -160 7 17 r 19 31) 546 31↓ 236 217 19

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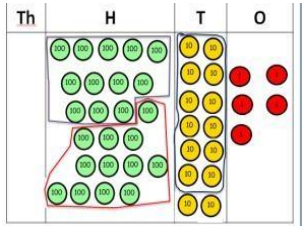
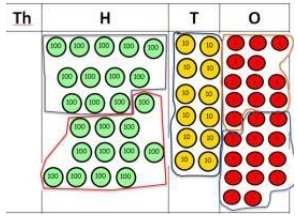
DIVISION

	Objective	Concrete	Pictorial	Abstract
Year 6	Long Division (continued)	Exchange the one hundred for ten tens so now we have 14 tens. How many groups of 12 are in 14? 1 remainder 2  $\begin{array}{r} 021 \\ 12\overline{)2544} \\ 24 \\ \hline 14 \\ 12 \\ \hline 2 \end{array}$ Exchange the two tens for twenty ones so now we have 24 ones. How many groups of 12 are in 24? 2  $\begin{array}{r} 0212 \\ 12\overline{)2544} \\ 24 \\ \hline 14 \\ 12 \\ \hline 24 \\ 24 \\ \hline 0 \end{array}$		