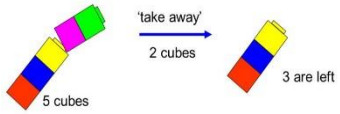
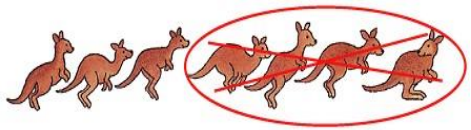
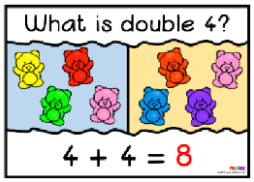
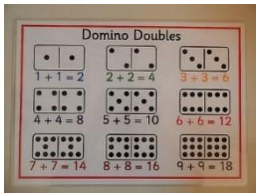
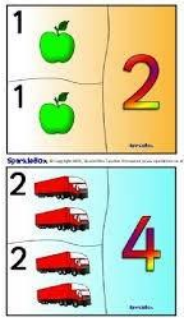
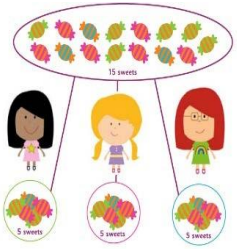
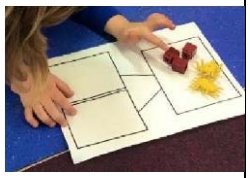
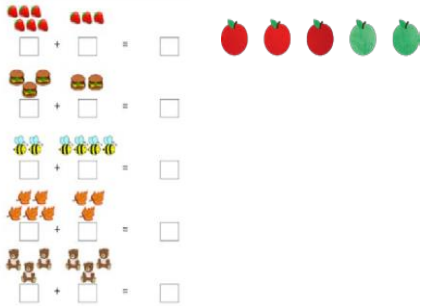
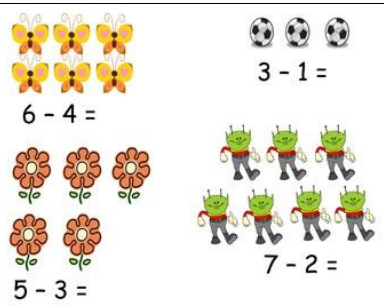
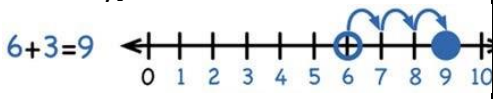
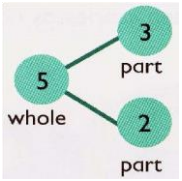
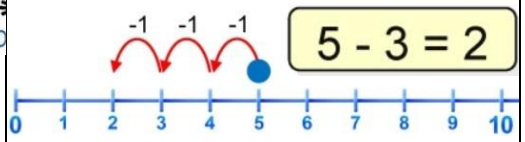
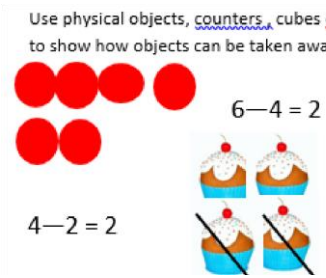
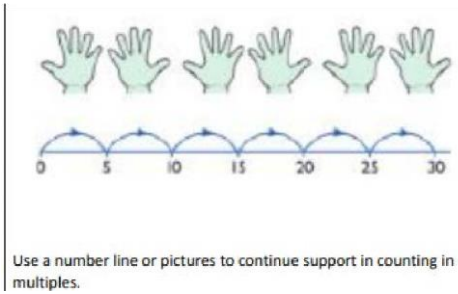
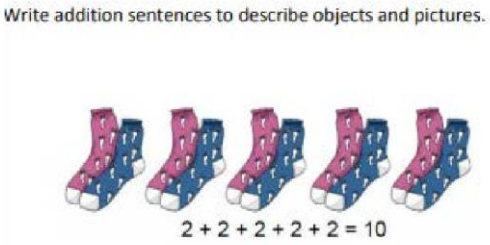
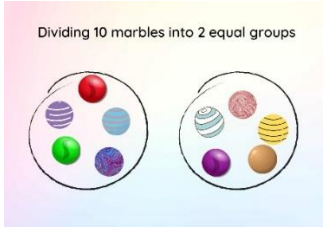
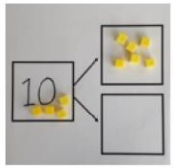
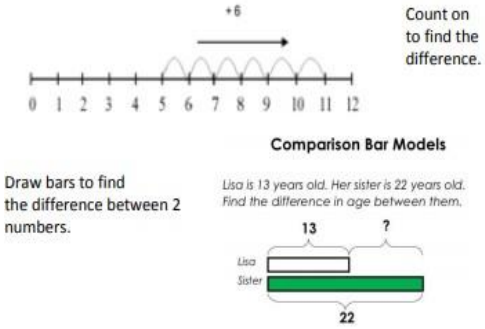
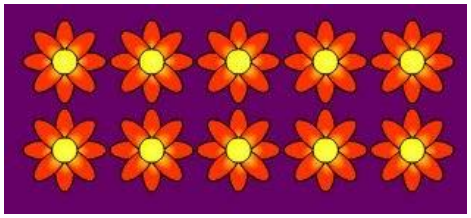
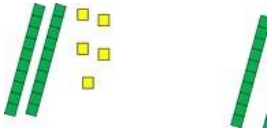
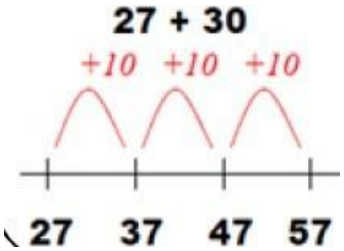
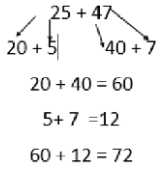
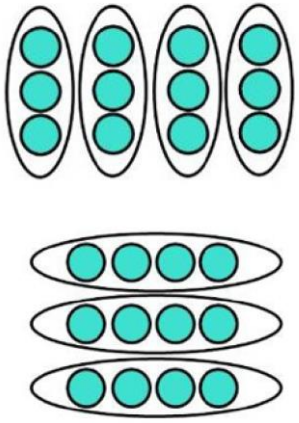
Maths Calculation guide Maids Moreton CE School January 2025

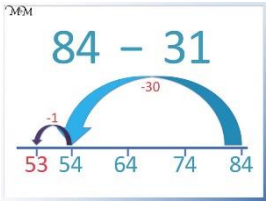
Year group	Addition	Subtraction	Multiplication	Division
EYFS	count reliably to 10 using 1 to 1 correspondence know that a group of things change in quantity when something is added. say 1 number for 1 object count in different arrangements conservation of number – know the final number said is the number in the group. find the total number of items in two groups by counting them all. use objects such as toys/ counters/numicon to physically manipulate and group  	count reliably to 10 using 1 to 1 correspondence know that a group of things change in quantity when something is taken away. say 1 number for 1 object count in different arrangements conservation of number –know the final number said is the number in the group. use objects such as toys/ counters/cubes/numicon to physically manipulate  cross out or cover drawn objects to show what has been taken away. 	See concept of doubling as adding two equal groups using physical and real life examples, e.g. 3 bears + 3 bears.   	Halve a whole e.g. physically cutting food, shapes, objects into 2 equal pieces.  Use practical resources to explore sharing a quantity of objects to 10 between 2 or more groups. [one for me, one for you, one for X]. Use pictorial resources to find 2 or more equal parts of a number.  See halving in relation to subitising e.g. knowing 4 is made of 2 groups of 2, so half of 4 is 2.

	add 2 groups of pictures to find the total.    count on from a 1 digit number number a set number of jumps. give one more than a given number to 10 write simple number sentences number bonds to 10 use the symbol for addition and the equals sign. begin to use the vocabulary of addition. solve simple problems including doubling.	 count back from a 1 digit number a set number of jumps –give one less than any given number to 10 – write simple number sentences – use the symbol for subtraction and the equals sign.  begin to use the vocabulary of subtraction.		

KS1	*[Use concrete objects and pictorial representations, then apply their increasing knowledge of mental and written methods].* **Year 1** Add 2 x 1 digit numbers (counting on in ones) 5 + 2 = 7 [concrete resources, numberline and mentally]  Use pictures and bar models to add two numbers together in a group, e.g. 3 flowers + 2 flowers.  Use pictures to add two numbers together as a group or in a bar.  Use part whole model.  Number bonds to 10, e.g. 6 + 4 related addition and subtraction facts]	*[Use concrete objects and pictorial representations, then apply their increasing knowledge of mental and written methods].* **Year 1** Subtract 2 x 1 digit numbers (counting back in ones) using concrete resources, numberline and mentally]  cross out drawn objects to show what has been taken away, e.g. 4 buns take away 2 buns.  Number bonds to 10 [related addition and subtraction facts], e.g. 104 = 6 Number bonds to 20 related addition and subtraction facts], e.g. 203 =17	*[Use concrete objects and pictorial representations, then apply their increasing knowledge of mental and written methods].* **Year 1** Use practical resources and pictures, then written addition sums mentally to double numbers to ten, e.g. 3 + 3. Use a number line/100 square and/or pictures to count in multiples of 2s,5s,10s.  Count mentally in 2s,5s,10s. Write repeated addition sentences to describe pictures.  	*[Use concrete objects and pictorial representations, then apply their increasing knowledge of mental and written methods].* **Year 1** Divide by sharing small quantities of concrete objects into groups. Use pictorial representations to share shapes and quantities. Solve one step problems involving division, by calculating the answer using concrete objects and pictorial representations with the support of the teacher. **Year 2** Understand division as grouping. Divide quantities into equal groups using counters and jottings. 

	Number bonds to 20, related addition and subtraction facts], e.g. 17 + 3 Missing number additions e.g. 14 + ? = 20 Add a 1 digit number to a 2 digit number (counting on in ones starting from the larger number) e.g. 35+3 [numberline/100 square and mentally] Add 10 to a multiple of 10 (40+10) using 100 square, empty number line and mentally  Add a multiple of 10 to a multiple of 10 (40+30) using 100 square, empty number line and mentally **Year 2** Add 3 x 1 digit numbers	Missing number subtractions, e.g. 14 ? = 8 Derive facts e.g. 6 + 4 = 10, so 106 = 4.  Link to addition. Use PPW model to model the inverse. If 10 is the whole and 6 is one of the arts, what s the other part? 10—6 = 4 Find the difference. Draw bars to show the difference between 2 numbers. E.g. 13 and 18. Count on to find the difference.  Subtract a 1 digit number from a 2 digit number (counting back in ones) 353 [numberline/100 square and mentally]	Use objects laid out in arrays to find the total e.g. to 2 lots of 5, 3 lots of 2 etc.  Solve one step problems involving multiplication, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. Through grouping small quantities, begin to understand multiplication. Make connections between arrays, number patterns, and counting in twos, fives and tens. **Year 2** Solve problems involving multiplication using materials, arrays, repeated addition, mental methods, and multiplication facts, including problems in contexts. Recall and use multiplication facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	Recall and use division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers Calculate mathematical statements for division within the multiplication tables and write them using the division (÷) and equals (=) signs Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot Solve problems involving division, using materials, jottings, mental methods, and multiplication and division facts, including problems in contexts. Use division as the inverse of multiplication.

	Add 10 to any 2 digit number (46+10) using dienes, 100 square and mentally  25 + 10 = 35 Explore that the ones digit does not change Add multiples of 10 to any 2 digit number (46+30) using 100 square, empty numberline and mentally  Add any 2 digit numbers not bridging the 10 using partitioning. 40 + 20 = 60 6 + 3 = 9 60 + 9 = 69  	Subtract 10 from a multiple of 10 (4010) using 100 square, empty numberline and mentally Subtract a multiple of 10 from a multiple of 10 (4030) [100 square, empty numberline and mentally] **Year 2** Subtract 10 from any 2 digit number (4610) using 100 square, empty numberline and mentally Subtract multiples of 10 from any 2 digit number (4630) using 100 square and mentally Subtract any 2 digit number without regrouping/exchanging using physical dienes resources and then a written representation of dienes. Children draw representations of Dienes and cross off.  43—21 = 22 Subtract any 2 digit number from another 2 digit number not bridging the 10 using empty number lines, recording jumps in 1s first and then 10s, e.g. 84-31 =	Calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (×),and equals (=) signs Show that multiplication of two numbers can be done in any order (commutative) Count in multiples of 2,3,4,5 and 10 from zero using fingers, numberlines, picture representations and mentally. Create arrays using counters. Use picture representations of arrays to show different calculations and to explore commutativity e.g. 3 x 4 = 12 4 x 3 = 12 Use representations of arrays to show different calculations and explore commutativity. 	

	Add any 2 digit numbers bridging the 10. using partitioning 46 + 27 40 + 20 = 60 6 + 7 = 13 60 + 13 = 73 Add 2 digits in formal column method if secure with all of the above. Number bonds to 100 using multiples of 10, e.g. 40+ 60 Missing number additions e.g. 84 + ? = 100 Derive facts e.g. 7 + 3 =10, so 70+30 =100. Recognise and use the inverse relationship between addition and subtraction and using this to check calculations and solve missing number problems Use the vocabulary of addition. [Y1 and y2] Using and applying addition skills to solve worded problems. [Y1 and Y2]	 Subtract any 2 digit numbers with regrouping/exchanging using physical dienes resources and then a written representation of dienes Subtract any 2 digit numbers with regrouping/exchanging. (4627) using empty number lines Subtract any 2 digit numbers with and without regrouping/exchanging using formal column method if secure on all of the above. Number bonds to 100 related addition and subtraction facts], using multiples of 10, e.g. 10040 Missing number subtractions, e.g. 54 ? = 48 Find the difference. Draw bars to show the difference between 2 numbers. E.g. 23 and 28, 40 and 70. 29 and 31. Count on and count back to find the difference.		

	Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot [Y1 and Y2]	Derive facts e.g.104 = 6 so 10040 =60. Recognise and use the inverse relationship between addition and subtraction and using this to check calculations and solve missing number problems. Use the vocabulary of subtraction [Yr 1 and 2]. Using and applying subtraction skills to solve worded problems. [Y1 and 2] Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. [Y1 and 2]		
	FOR BREAKDOWN OF CONCRETE, PICTORIAL, ABSTRACT AND WRITTEN METHODS SEE APPENDIX BELOW			
LKS 2	*[Use place value counters and dienes where needed for specific pupils]* **Year 3** Add ones to a 3 digit number – counting in ones Add multiples of 10 to a 3 digit multiples of 10 using blank numberline then mentally.	*[Use place value counters and dienes where needed for specific pupils]* Subtract ones from a 3 digit number counting back in ones Subtract multiples of 10 from a 3 digit multiples of 10 using blank numberline then mentally.	**Year 3** Solidify solving problems involving multiplication using materials, arrays, repeated addition, mental methods, and multiplication facts, including problems in contexts. Recalling and use multiplication facts for the 3, 4 and 8 multiplication tables	**Year 3** Solidify solving problems involving division using materials, arrays, mental methods, and multiplication facts, including problems in contexts.

	Add 100s to 3 digit number using blank numberline then mentally. Column written method for 3 digit number – no exchanging Column – with exchanging Column – multiple exchanging Column – zero as a placeholder Column – 3 digit + 2 digit Column – missing number calculations **Year 4** as above with 4 digit numbers Introduce adding decimals with 2 decimal places in the context of money e.g. £23.59 + £7.55 Continue to solve the above mentally with greater efficiency and accuracy Estimate the answer to a calculation and use inverse operations to check answers Solve addition twostep problems in contexts, deciding which operations and methods to use and why.	Subtract 100s to 3 digit number using blank numberline then mentally. Expanded form for 3 digit numbers. Column written method for 3 digit number – no exchanging Column – with exchanging Column – multiple exchanging Column – zero as a placeholder Column – 3 digit + 2 digit Column – missing number calculations Find the difference. **Year 4** as above with 4 digit numbers Introduce subtracting decimals with 2 decimal places in the context of money e.g. ££15.10£7.95 Continue to solve the above mentally with greater efficiency and accuracy	Write and calculate mathematical statements for multiplication using known multiplication tables including for two digit numbers times one digit numbers, using mental and progressing to formal written methods Solve problems, including missing number problems, involving multiplication, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects. Multiply a two digit number by a one digit number. Connect the 2,4, and 8 multiplication tables through doubling. Use mental recall of multiplication tables when calculating mathematical statements in order to improve fluency. Develop efficient mental methods, for example, using commutativity and associativity (for example, 4 × 12 × 5 = 4 × 5 × 12 = 20 × 12 = 240) Develop reliable written methods for multiplication, starting with calculations of twodigit numbers by onedigit numbers and progressing to	Recall and use division facts for the 3, 4 and 8 multiplication tables Write and calculate mathematical statements for division using known multiplication tables including for two digit numbers times one digit numbers, using mental and progressing to formal written methods Solve problems, including missing number problems, involving division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects. Use mental recall of multiplication tables when calculating mathematical statements in order to improve fluency. Develop efficient mental methods, for example, using multiplication and division facts (for example, using 3 × 2 = 6, 6 ÷ 3 = 2 and 2 = 6 ÷ 3) to derive related facts (for example, 30 × 2 = 60, 60 ÷ 3 = 20 and 20 = 60 ÷ 3).

	Continue to practise both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency, accuracy and efficiency.	Estimate the answer to a calculation and use inverse operations to check answers Solve subtraction twostep problems in contexts, deciding which operations and methods to use and why. Continue to practise both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency, accuracy and efficiency.	the formal written methods of short multiplication Solve simple problems in contexts, deciding which of the four operations to use and why including measuring and scaling contexts, (for example, four times as high, eight times as long etc.) Solve correspondence problems in which m objects are connected to n objects (for example, 3 hats and 4 coats, how many different outfits? Use grid method, progressing to formal written method. **Year 4** Recall multiplication facts for multiplication tables up to 12 × 12 to aid fluency. use place value, known and derived facts to multiply mentally, including: multiplying by 0 and 1; multiplying together three numbers recognise and use factor pairs and commutativity in mental calculations multiply twodigit and threedigit numbers by a onedigit number using formal written layout –column multiplication.	Develop reliable written methods for division, starting with calculations of twodigit numbers by onedigit numbers and progressing to the formal written methods of short division. Solve simple problems in contexts, deciding which of the four operations to use and why including measuring and scaling contexts, (for example, four times as short.) Solve correspondence problems e.g. 12 sweets shared equally between 4 children; 4 cakes shared equally between 8 children) Use grid method, progressing to formal written method. Solve division problems with a remainder e.g. 14 divided by 3. **Year 4** Recall division facts for multiplication tables up to 12 × 12 to aid fluency. Divide up to 3 digit numbers by 1 digit [short division].

			[Use place value counters and grid method first for those pupils who need it]. solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects. Improve fluency in the formal written method of short multiplication with exact answers **(see Mathematics Appendix 1 of National curriculum).** Write statements about the equality of expressions (for example, use the distributive law 39 × 7 = 30 × 7 + 9 × 7 and associative law (2 × 3) × 4 = 2 × (3 × 4). Combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations for example, 2 x 6 x 5 = 10 x 6 = 60. Solve twostep problems in contexts, choosing the appropriate operation, working with increasingly harder numbers including correspondence questions such as the numbers of choices of a meal on a menu	Use place value, known and derived facts to divide mentally, including: dividing by 1 Recognise and use factor pairs and commutativity in mental calculations Use mental methods and extend this to threedigit numbers to derive facts, (for example 600 ÷ 3 = 200 can be derived from 2 x 3 = 6) Improve fluency in the formal written method of short division with exact answers **(see Mathematics Appendix 1 of National Curriculum).** Solve twostep problems in contexts, choosing the appropriate operation, working with increasingly harder numbers including correspondence questions such as three cakes shared equally between 10 children.

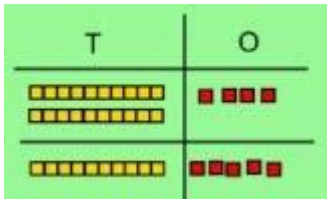
UK S2	**Year 5 and 6** As above with 5+ digit numbers. Add whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) Add numbers mentally with increasingly large numbers Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy Solve addition multistep problems in contexts, deciding which operations and methods to use and why. Add several numbers of increasing complexity, including adding money, measures and decimals with different numbers of decimal points. Continue to practise both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency, accuracy and efficiency.	**Year 5 and 6** As above with 5+ digit numbers. Subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) Subtract numbers mentally with increasingly large numbers Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy Solve subtraction multistep problems in contexts, deciding which operations and methods to use and why. Subtract with at least 4 digits including money and measures. Subtract with increasingly large and more complex numbers and decimal values up to 3 decimal places. Continue to practise both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency, accuracy and efficiency.	**Year 5** Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers multiply numbers up to 4 digits by a one or two digit number using a formal written method, including long multiplication for twodigit numbers multiply numbers mentally drawing upon known facts multiply whole numbers and those involving decimals by 10, 100 and 1000 recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) solve problems involving multiplication including using their knowledge of factors and multiples, squares and cubes understand the terms factor, multiple and prime, square and cube numbers and use them to construct equivalence statements (for example, 4 x 35 = 2 x 2 x 35; 3 x 270 = 3 x 3 x 9 x 10 = 92 x 10).	**Year 5** Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers establish whether a number up to 100 is prime and recall prime numbers up to 19 divide numbers mentally drawing upon known facts divide numbers up to 4 digits by a onedigit number using the formal written method of short division and interpret remainders appropriately for the context divide whole numbers and those involving decimals by 10, 100 and 1000 solve problems involving addition, subtraction, multiplication and division and a combination of these,

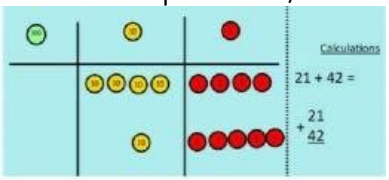
			solve problems involving multiplication including scaling by simple fractions and problems involving simple rates. practise and extend use of the formal written methods of short multiplication (see Mathematics Appendix 1). apply all the multiplication tables frequently, commit them to memory and use them confidently to make larger calculations. use and explain the equals sign to indicate equivalence, including in missing number problems (for example, 13 + 24 = 12 + 25; 33 = 5 x). **Year 6** multiply multidigit numbers up to 4 digits by a twodigit whole number using the formal written method of short and long multiplication (see Mathematics Appendix 1). perform mental calculations, including with mixed operations and large numbers identify common factors, common multiples and prime numbers	including understanding the meaning of the equals sign solve problems involving division, including scaling by simple fractions and problems involving simple rates. practise and extend use of the formal written methods of short division (see Mathematics Appendix 1). apply all the multiplication tables and related division facts frequently, commit them to memory and use them confidently to make larger calculations. interpret noninteger answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding (for example, 98 ÷ 4 = 4 98 = 24 r 2 = 24 2 1 = 24.5 ≈ 25). use multiplication and division as inverses to support the introduction of ratio in year 6, for example, by multiplying and dividing by powers of 10 in

			use knowledge of the order of operations to carry out calculations involving the four operations use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency. Pupils explore the order of operations using brackets; for example, 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9. Multiply decimals up to 2 decimal place by a single digit.	scale drawings or by multiplying and dividing by powers of a 1000 in converting between units such as kilometres and metres. Distributivity can be expressed as a(b + c) = ab + ac. **Year 6** divide numbers up to 4 digits by a twodigit whole number using the formal written method of long and short division (see Mathematics Appendix 1). interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context divide numbers up to 4 digits by a twodigit number using the formal written method of short division where appropriate, interpreting remainders according to the context perform mental calculations, including with mixed operations and large numbers identify common factors, common multiples and prime numbers

Appendix

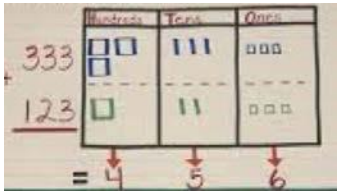
<table>
<tr><th colspan="4">Addition - Year 3</th></tr>
<tr><th>Objective and Strategy</th><th>Concrete</th><th>Pictorial</th><th>Abstract</th></tr>
<tr>
<td>Add and subtract numbers with up to 3-digits, using formal written methods of columnar addition

Column addition (no regrouping)</td>
<td> 

Using manipulatives (dienes, numicon, counters), children are to line up hundreds, tens and ones.
 

Children should be secure with using PV counters before moving onto pictorial.

The calculation will be shown alongside the model used to see the connection

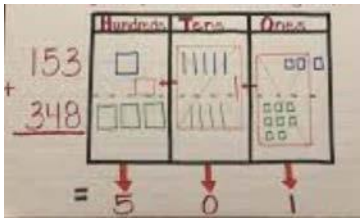
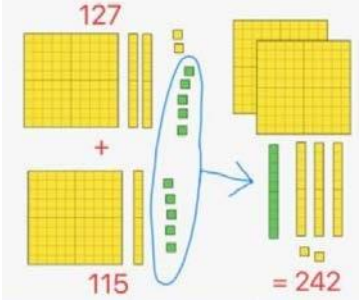
<table>
<tr><th>Model</th><th>Calculation</th></tr>
<tr><td></td><td></td></tr>
</table>
</td>
<td> 

Children are to draw, in a PV frame, the manipulatives, that they are using.

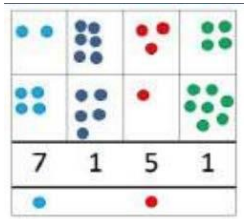
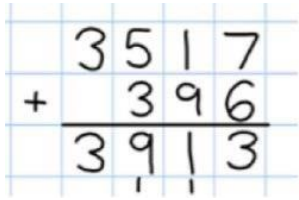
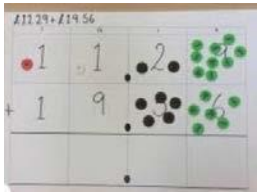
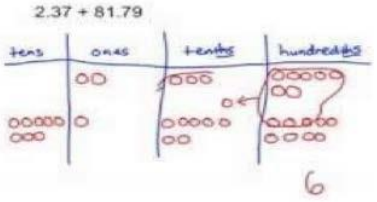
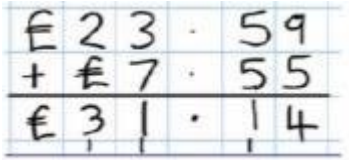
Secure knowledge of representation with the PV columns.

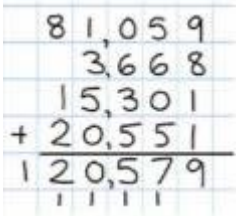
The calculation will be shown alongside the model to see the connection

<table>
<tr><th>Model</th><th>Calculation</th></tr>
<tr><td></td><td></td></tr>
</table>
</td>
<td>2 2 3
+ 1 1 4
3 3 7
Children to move onto recording more formally.
Some children may need to use the expanded method (see below).</td>
</tr>
</table>

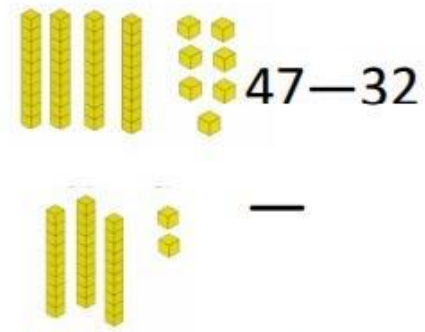
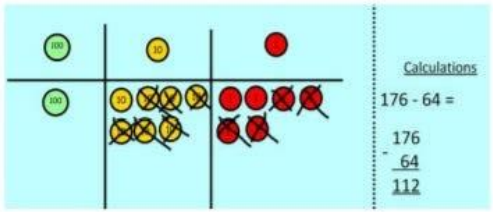
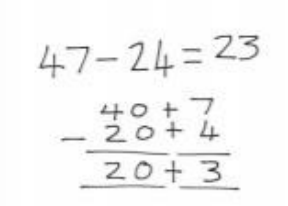
Column addition (with regrouping)		 Children can draw a representation of the grid to further support their understanding, carrying the ten ***underneath*** the line.	$\begin{array}{r} 536 \\ +\ 85 \\ \hline 621 \\ \scriptstyle 1\ 1 \end{array}$
	 Exchange ten ones for a ten. Model using Dienes, Numicon and place value counters.		

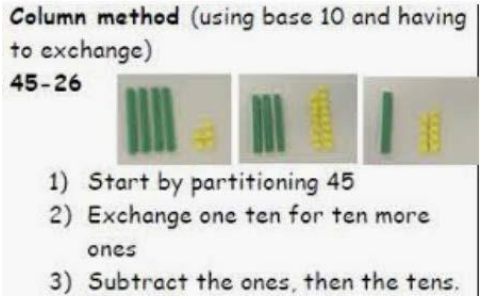
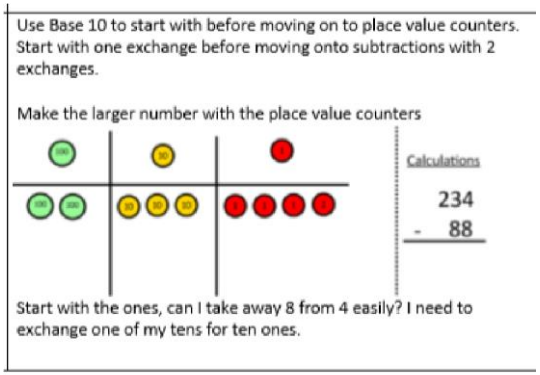
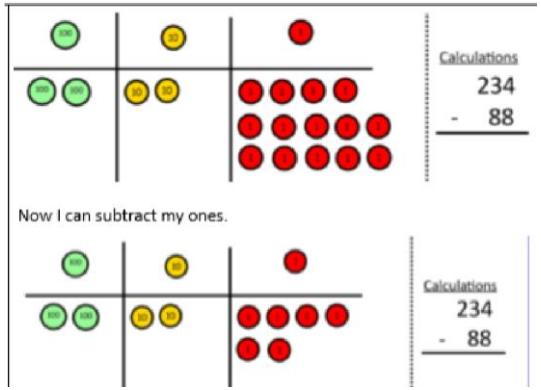
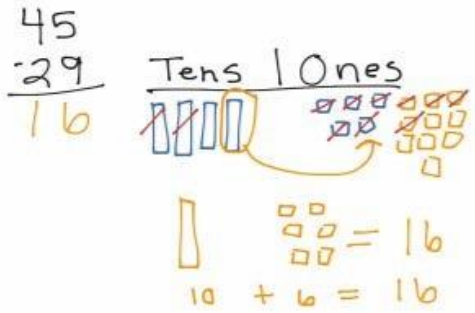
Addition - Year 4

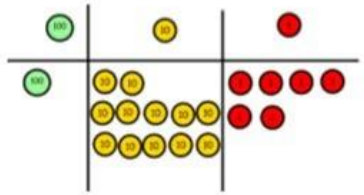
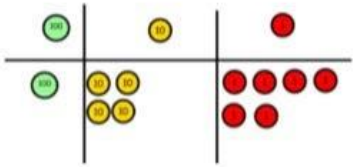
Objective and Strategy	Concrete	Pictorial	Abstract
Using formal written methods of columnar addition where appropriate Add numbers with up to 4 digits (with exchange)	Children continue to use dienes or place value counters to add, exchanging ten ones for a ten and ten tens for a hundred and ten hundreds for a thousand.  The calculation will be shown alongside the manipulative used to see the connection **Model** **Calculation**	 Children can draw a pictoral representation of the columns and place value counters to further support their learning and understanding.	 Continue from previous work to carry hundreds as well as tens.
Add decimals with 2 decimal places, including money.	 Introduce decimal place value counters and model exchange for addition .	 	 As the children move on, introduce decimals with the same number of decimal places and different. Money can be used here.

Addition - Year 5/6			
Objective and Strategy	**Concrete**	**Pictorial**	**Abstract**
Add numbers with more than 4 digits.	See Year 4	See Year 4	 Children should have abstract supported by a pictorial or concrete if needed.
Add several numbers of increasing complexity, including adding money, measure and decimals with different numbers of decimal points.	See Year 4	See Year 4	  Insert zeros for place holders.

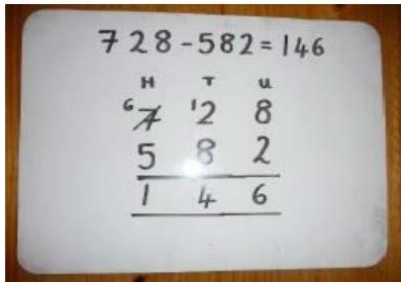
Subtraction - Year 3

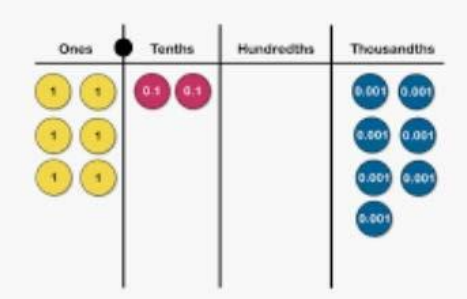
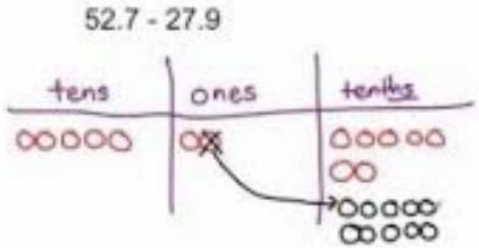
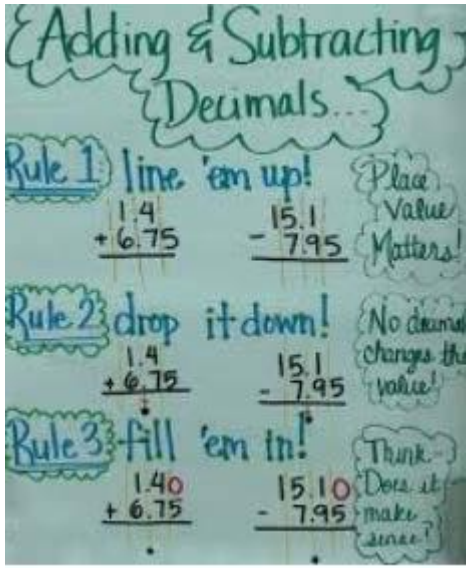
Objective and Strategy	Concrete	Pictorial	Abstract
To subtract numbers with up to three-digits, using formal written methods of columnar subtraction Column subtraction (without exchanging)	 Use base 10 or Numicon to model The calculation will be shown alongside the model chosen to see the connection **Model** | **Calculation**	Children are to be secure with use of PV counters before moving onto abstract. 	Children should begin with the expanded form. Moving onto a more formal way as below.  

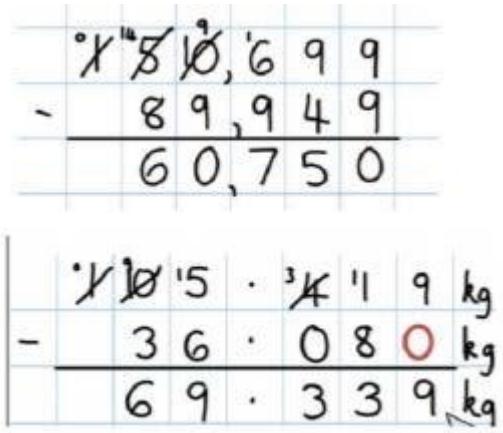
Column Subtraction (with exchanging)	Begin with base 10 or Numicon. Move to pv counters, modelling the exchange of a ten into ten ones. Use the phrase 'take and make' for exchange.  **Column method** (using base 10 and having to exchange) **45-26** 1) Start by partitioning 45 2) Exchange one ten for ten more ones 3) Subtract the ones, then the tens.  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 one of my tens for ten ones.  Calculations 234 - 88 Now I can subtract my ones. Calculations 234 - 88	 45 -29 16 Tens Ones = 16 10 + 6 = 16 When confident, children can find their own way to record the exchange/regrouping	Moving onto a more formal way as below  728-582=146 H T U 6 12 8 5 8 2 1 4 6

	Now look at the tens, can I take away 8 tens easily? I need to exchange one hundred for ten tens.  Calculations 234 - 88 Now I can take away eight tens and complete my subtraction  Calculations ~~2~~ ~~3~~ 4 - 88 146 Show children how the concrete method links to the written method alongside your working. Cross out the numbers when exchanging and show where we write our new amount.	

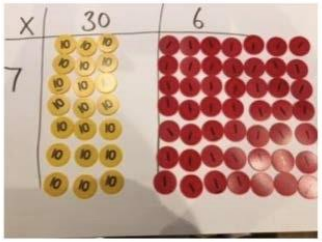
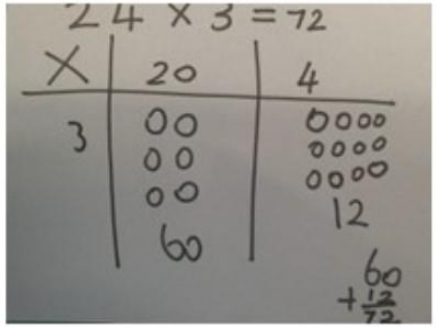
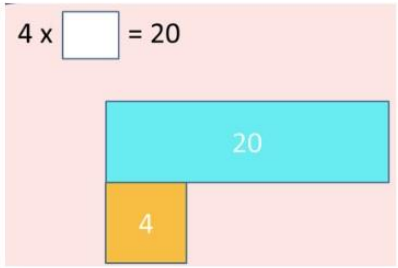
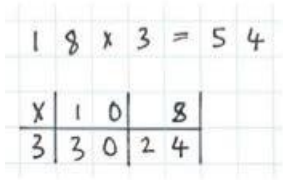
Subtraction - Year 4

Objective and Strategy	Concrete	Pictorial	Abstract
Subtract numbers with up to 4 digits using the formal written methods appropriate of columnar subtraction where appropriate Year 4 subtraction with up to 4 digits.	Model process of exchange using Numicon, base ten and then move to PV counters. The calculation will be shown alongside the model chosen to see the connection **Model** **Calculation**	Children to draw pv counters and show their exchange—see Y3 The calculation will be shown alongside the model chosen to see the connection **Model** | **Calculation**	 This will lead to an understanding of subtracting any number including decimals.

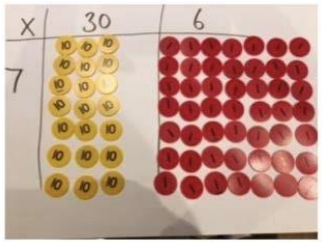
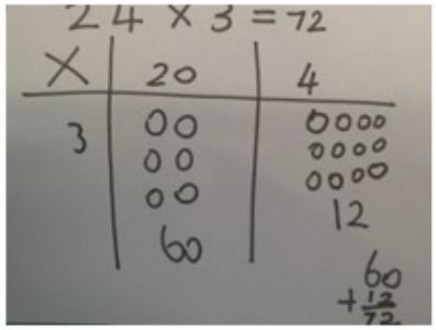
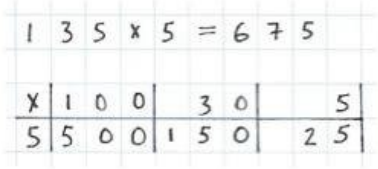
Introduce decimal subtraction through context of money	Children to be encouraged to use counters to represent numbers and take counters away to subtract. 	 When confident, children can find their own way to record the exchange/regrouping	

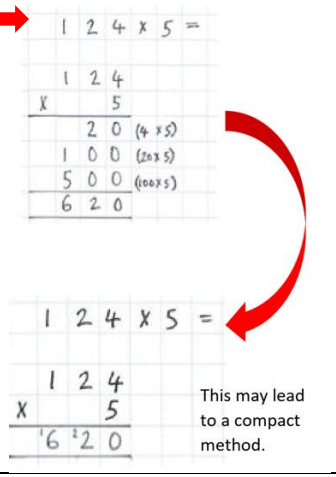
Subtraction- Year 5/6			
Objective and Strategy	**Concrete**	**Pictorial**	**Abstract**
Subtract with at least 4 digits, including money and measures. Subtract with increasingly large and more complex numbers and decimal values (up to 3 decimal place).	See Year 4	See Year 4	

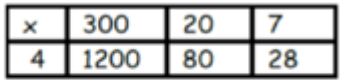
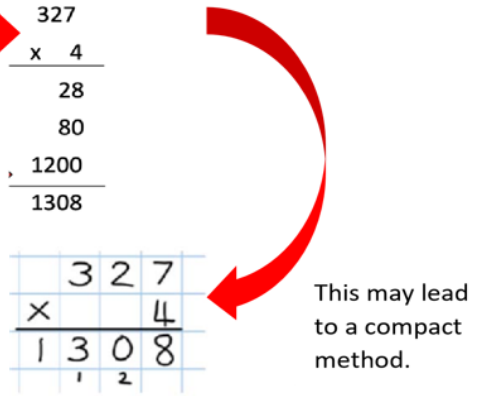
Multiplication - Year 3

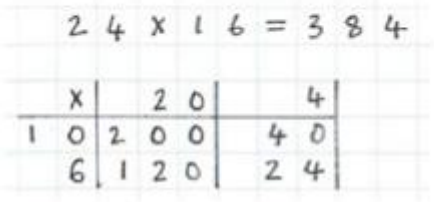
Objective and Strategy	Concrete	Pictorial	Abstract
Multiplying two digit number by a one digit number Grid method progressing to the formal method. Solving problems including missing number problems, integer scaling problems.	Move on to place value counters to show how we are finding groups of a number.  Add up each column, starting with the ones making any exchanges needed. The calculation will be shown alongside the model chosen to see the connection **Model** | **Calculation**	Children can represent their work with place value counters in a way that they understand. They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.  Bar model are used to explore missing numbers  	Start with multiplying by one digit numbers and showing the clear addition alongside the grid. TO x O  Children to add up each column to find the answer.

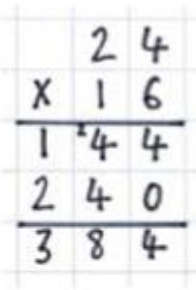
Multiplication- Year 4

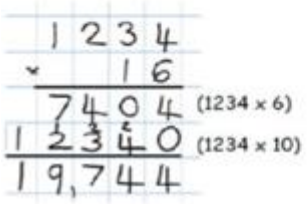
Objective and Strategy	Concrete	Pictorial	Abstract
Multiply two digit and three-digit numbers by a one-digit number using formal written layout Grid method recap from year 3 for 2 digits x 1 digit Multiplying numbers by 1 digit (year 4 expectation)		Children can represent their work with place value counters in a way that they understand. They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below. 	HTO x O  Children to add up each column to find the answer.

Column multiplication	The calculation will be shown alongside the model chosen to see the connection **Model** | **Calculation** |	This grid method may be used to show how this relates to a formal written method. **×** | **100** | **20** | **4** **5** | 500 | 100 | 20	

Multiplication- Year 5/6			
Objective and Strategy	**Concrete**	**Pictorial**	**Abstract**
Multiply numbers up to 4 digits by a 1 digit number using formal written method including long multiplication for 2 digit numbers. Column multiplication for 3 and 4 digit numbers x 1 digit number			

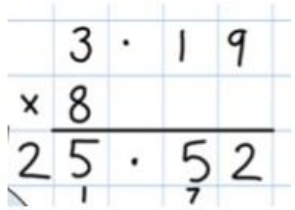
<table>
<tr>
<td>Column multiplication (long multiplication)</td>
<td>Manipulatives may still be used with the corresponding long multiplication modelled alongside
<table>
<tr><th>Model</th><th>Calculation</th></tr>
<tr><td></td><td></td></tr>
</table>
</td>
<td>Moving forward, multiply by a 2 digit number showing the different rows within the grid method.


</td>
<td>


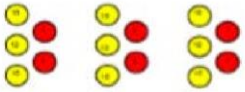
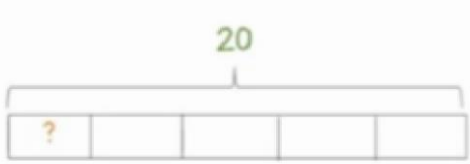
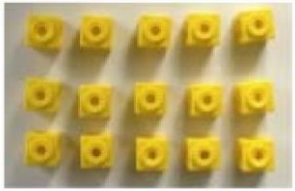
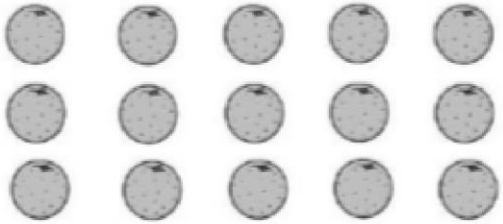
24 x 6 on the first row.
(6 x 4 = 24, carrying the 2 for the 20, then 6 x 2)
24 x 10 on the second row. Show multiplying by 10 by putting zero in the units first.


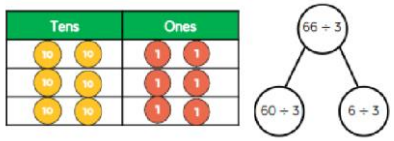
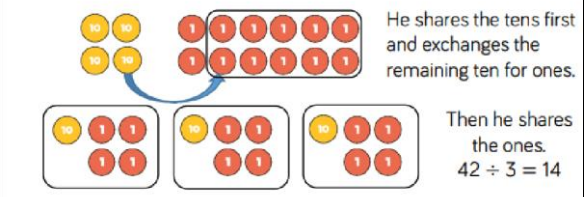
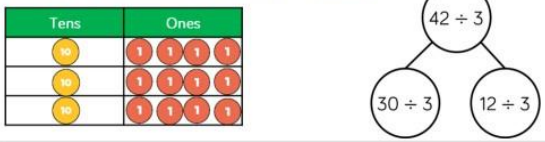
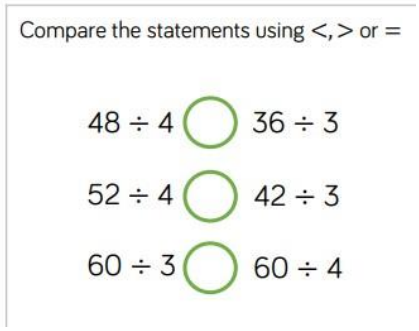
</td>
</tr>
<tr>
<td>Vocabulary</td>
<td colspan="3">Groups of, lots of, times, array, altogether, multiply, multiplied by, repeated addition, sets of, equal groups, times as big as, commutative, product, multiples of, scale up, inverse, derive, factor pairs, composite numbers, prime number, factors, squared, cubed, multiplicative relationship</td>
</tr>
</table>

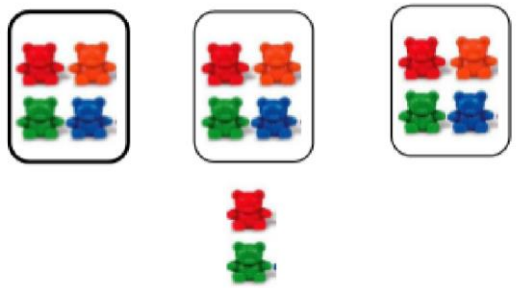
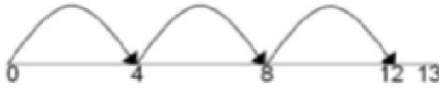
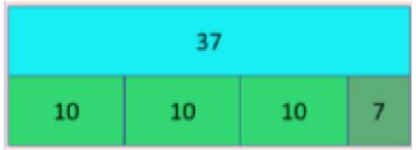
Multiplication - Year 6

Objective and Strategy	Concrete	Pictorial	Abstract
Multiply decimal up to 2 decimal place by a single digit.			Remind children that the single digit belongs in the units column. Line up the decimal points in the question and the answer. 

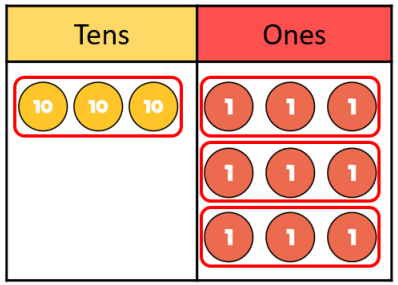
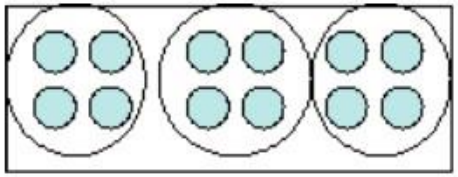
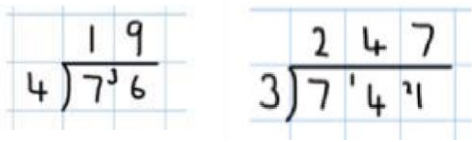
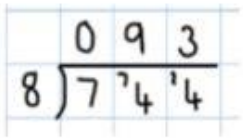
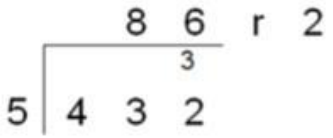
Division - Year 3

Objective and Strategy	Concrete	Pictorial	Abstract
Division as grouping	96 ÷ 3 = 32 	Continue to use bar modelling to aid solving division problems.  20 ÷ 5 = ? 5 x ? = 20	How many groups of 6 in 24? 24 ÷ 6 = 4
Division with arrays	 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 eight linking number sentences. 7 x 4 = 28 4 x 7 = 28 28 ÷ 7 = 4 28 ÷ 4 = 7 28 = 7 x 4 28 = 4 x 7 4 = 28 ÷ 7 7 = 28 ÷ 4

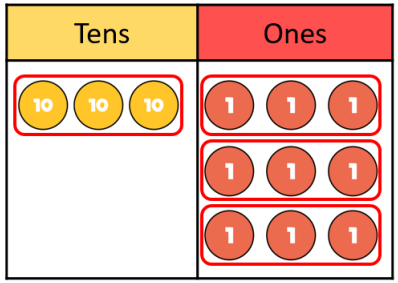
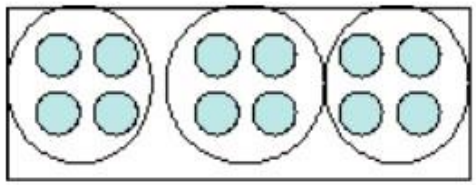
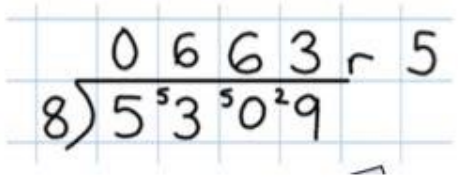
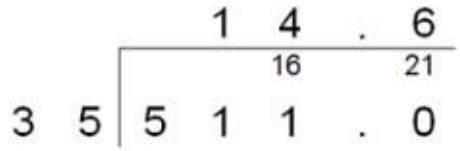
Divide 2digit numbers by a 1 digit number by partitioning into tens and ones using a place value grid	Eva uses a place value grid and part-whole model to solve 66÷ 3 	See part- whole model	
Divide numbers that involve exchanging between the tens and ones. The answers do not have remainders.	Ron uses place value counters to divide 42 into three equal groups.  He shares the tens first and exchanges the remaining ten for ones. Then he shares the ones. 42 ÷ 3 = 14	Annie uses a similar method to divide 42 by 3  Children may use pictorial representation for the pv counters, alongside the part-whole model Children use their times-tables to partition the number into multiples of the divisor.	96 ÷ 8 96 ÷ 4 96 ÷ 3 96 ÷ 6 

Division with a remainder	**14 ÷ 3 =** Divide objects between groups and see how much is left over  Use place value counters to work out 94 ÷ 4 Did you need to exchange any tens for ones? Is there a remainder?  Tens / Ones 29 Moving on to:	Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.  Draw dots and group them to divide an amount and clearly show a remainder.  Use bar models to show division with remainders. 	Complete written divisions and show the remainder using r. 

Division - Year 4

Objective and Strategy	Concrete	Pictorial	Abstract
Divide up to 3 digit numbers by 1 digit. Short Division	 Use PV counters to divide into groups 39÷3	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  Children should be aware that a 0 is used to keep place value, if the number is not divisible.  Move onto divisions with a remainder. 

Division - Year 5

Objective and Strategy	Concrete	Pictorial	Abstract
Divide at least 4 digit numbers by 1 digit. Interpret remainders appropriately for the context Short Division	 Use PV counters to divide into groups 39÷3	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.	 Finally move into decimal places to divide the total accurately. 

Division - Year 6

Objective and Strategy	Abstract
Long Division	Step 1 – a remainder in the ones

```
   h t o
   0 4 1 R1
4 ) 1 6 5
```

4 does not go into 1 (hundred). So combine the 1 hundred with the 6 tens (160).

4 goes into 16 four times.

4 goes into 5 once, leaving a remainder of 1.

```
    th h t o
    0 4 0 0 R7
8 ) 3 2 0 7
```

8 does not go into 3 of the thousands. So combine the 3 thousands with the 2 hundreds (3,200).

8 goes into 32 four times (3,200 ÷ 8 = 400)
8 goes into 0 zero times (tens).
8 goes into 7 zero times, and leaves a remainder of 7.

```
     h t o
     0 6 1
4 ) 2 4 7
    - 4
      3
```

When dividing the ones, 4 goes into 7 one time. Multiply 1 × 4 = 4, write that four under the 7, and subract. This finds us the remainder of 3.

Check: 4 × 61 + 3 = 247

```
     th h t o
     0 4 0 2
4 ) 1 6 0 9
    - 8
      1
```

When dividing the ones, 4 goes into 9 two times. Multiply 2 × 4 = 8, write that eight under the 9, and subract. This finds us the remainder of 1.

Check: 4 × 402 + 1 = 1,609

Step 2 – a remainder in the tens

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.

Step 3 – a remainder in any of the place values

1. Divide.	2. Multiply & subtract.	3. Drop down the next digit.
h t o 1 2)2 7 8	h t o 1 2)2 7 8 -2 0	h t o 1 8 2)2 7 8 -2 ↓ 0 7
Two goes into 2 one time, or 2 hundreds ÷ 2 = 1 hundred.	Multiply 1 × 2 = 2, write that 2 under the two, and subtract to find the remainder of zero.	Next, drop down the 7 of the tens next to the zero.
Divide.	**Multiply & subtract.**	**Drop down the next digit.**
h t o 1 3 2)2 7 8 -2 0 7	h t o 1 3 2)2 7 8 -2 0 7 - 6 1	h t o 1 3 2)2 7 8 -2 0 7 - 6 1 8
Divide 2 into 7. Place 3 into the quotient.	Multiply 3 × 2 = 6, write that 6 under the 7, and subtract to find the remainder of 1 ten.	Next, drop down the 8 of the ones next to the 1 leftover ten.
1. Divide.	**2. Multiply & subtract.**	**3. Drop down the next digit.**
h t o 1 3 9 2)2 7 8 -2 0 7 - 6 1 8	h t o 1 3 9 2)2 7 8 -2 0 7 - 6 1 8 -1 8 0	h t o 1 3 9 2)2 7 8 -2 0 7 - 6 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 to find the remainder of zero.	There are no more digits to drop down. The quotient is 139.