LC2 Calculation Policy

Progression in Calculations

Introduction

This policy was created in response to a need across Learning Community 2 schools and after discussion between Headteachers; to have a standard calculation policy that met the National Curriculum guidelines and provided a consistent approach to calculation that could be used within year groups across LC2 schools and as a progression through the phases.

The policy has been developed with a concrete, pictorial and abstract (CPA) approach in order to scaffold and develop pupils' understanding. The CPA approach is relevant across all ages in order to secure understanding and gain conceptual and procedural fluency.

If children are not at age related expectations for their year the policy will be helpful in tracking back to previous learning. This will enable pupils to develop understanding of calculation methods rather than to have to memorise procedures.

We have given an indication of pitch for the stages in our calculation policy.

A note about carrying digits – the examples in this document reflect the variety of carrying methods used across schools.

NB: This is version 2 of the LC2 Calculation Policy and incorporates changes made during the Maths Subject Leader Session on Thursday 19th October 2017.

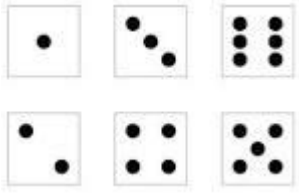
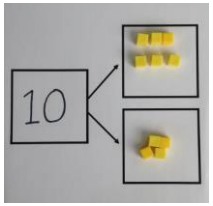
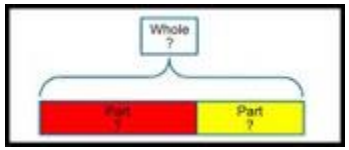
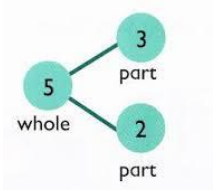
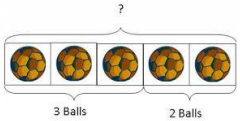
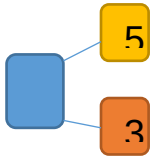
LC2 Calculation Policy

CONTENTS

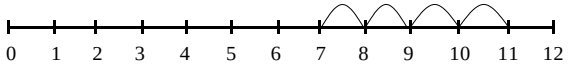
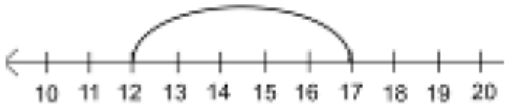
LC2 Overview of Approaches by Year Group

		EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition	Rhymes and songs. Practical. Mark making. Use concrete & physical representations. Draw objects.	Combining sets (count all then count on). Partitioning sets and some part part whole. To use a number line practically to add. Use numbers to represent objects, to begin to record.	Combining two parts to make a whole. Part whole model. Starting at the bigger number and counting on. Regrouping to make 10.	Adding three single digits. Partitioning. Column method – no regrouping. Some exchange.	Column method with regrouping (up to 3 digits).	Column method with regrouping. (up to 4 digits).	Column method with regrouping (with more than 4 digits). Column method - decimals - with the same amount of decimal places.	Column method with regrouping. Column method - decimals - with different amounts of decimal places.
Subtraction		Partitioning. Physically take away objects. To use a number line practically to subtract. Use numbers to represent objects, to begin to record.	Taking away ones. Counting back. Find the difference. Part whole model. Make 10.	Counting back; counting on. Find the difference, part whole model, make 10. Column method - no regrouping. Some exchange.	Column method with regrouping (up to 3 digits).	Column method with regrouping (up to 4 digits).	Column method with regrouping (with more than 4 digits). Column method - decimals - with the same amount of decimal places	Column method with regrouping. Column method - decimals - with different amounts of decimal places.
Multiplication		Doubling. Grouping - making equal groups.	Doubling. Equal groups. Counting in multiples. Arrays (with support).	Doubling /halving. Counting in multiples. Repeated addition arrays - showing commutative multiplication. Include x symbol.	Counting in multiples. Repeated addition Arrays - showing commutative multiplication. Grid method with apparatus.	Grid method (as a step towards long multiplication). Column multiplication. (2 and 3 digit multiplied by 1 digit).	Column multiplication (up to 4 digit numbers multiplied by 1 or 2 digits). Decimals.	Column multiplication (multi digit up to 4 digits by a 2 digit number). Decimals.
Division		Doubling/halving. Sharing. Grouping - making equal groups.	Sharing objects. Division as grouping into equal sized groups .	Doubling/halving. Division as grouping and sharing. Division within arrays. Bar model.	Division within arrays. Division with a remainder. Short division (2 digits by 1 digit - concrete and pictorial).	Division within arrays. Division with a remainder / as a fraction. Short division with regrouping (up to 3 digits by 1 digit- concrete and pictorial).	Short division. (up to 4 digits by a 1 digit number - interpret remainders appropriately for the context).	Short division. Long division (up to 4 digits by a 2 digit number - interpret remainders as whole numbers, fractions or round).

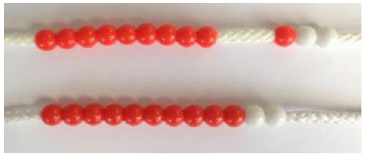
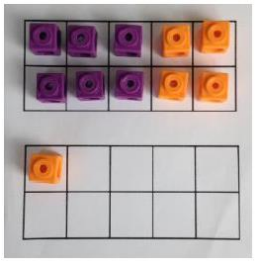
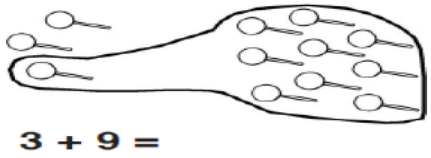
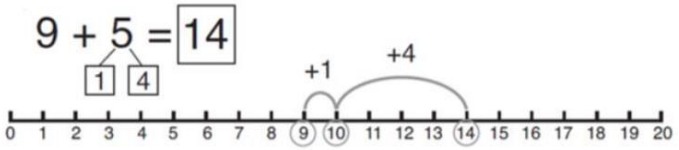
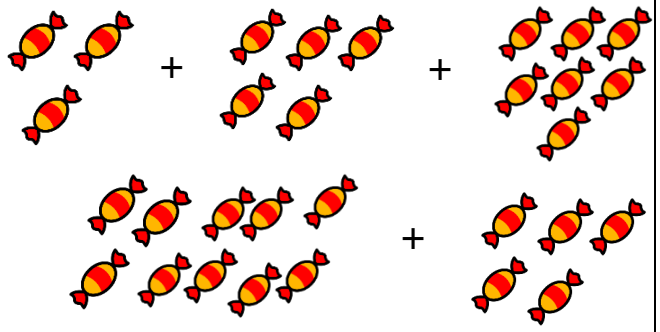
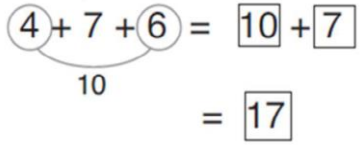
Addition

Year	Strategy/Approach	Concrete	Pictorial	Abstract
EYFS	Subitising	Children need to recognise a small group of objects/dots/fingers as the total without counting them	 Use a range of resources e.g. stones before moving to recording	Pupils recognise amounts without counting.
EYFS Y1	Combining two parts to make a whole: part - whole model	   Use cubes to add two numbers together as a group or in a bar.  With lots of real objects 	    Use pictures to add two numbers together as a group or in a bar. 	Consideration is needed when to introduce symbols. 4 + 3 = 7 10 = 6 + 4 2 + 2 = 3 + 1  Use the part-part whole diagram as shown above to move into the abstract. Looking for patterns in calculations

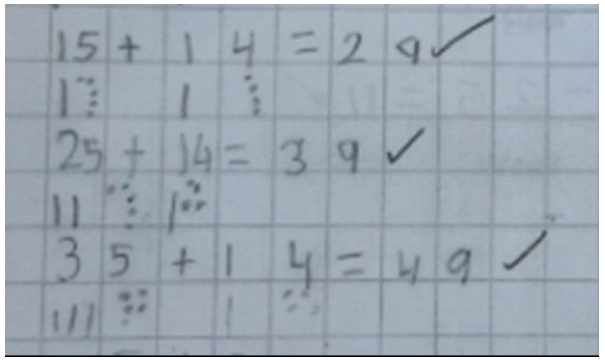
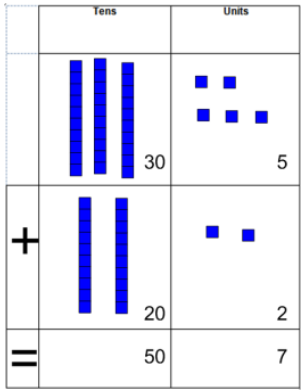
Addition

Year	Strategy/Approach	Concrete	Pictorial	Abstract
		Underlying skills: • Number recognition 0 -10 and then to 20 • Know that numbers identify how many objects are in a set • Recognise numbers and represent them using objects • Count objects accurately using one to one correspondence matching a number name to each object • Know how to write each number • Being able to count on from numbers other than 0		Vocabulary: add, more, and make, sum, altogether count on group how many? one more, two more, ten more, Same as
EYFS Y1	Starting at the bigger number and counting on	 Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.	7 + 4 In jumps of one.  Children will begin to record their work as number sentences then become more efficient by using facts and not needing to count in ones. 12 + 5 = 17  Start at the larger number on the number line and count on in ones or in one jump to find the answer.	5 + 12 = 17 Place the larger number in your head and count on the smaller number to find your answer. 'Counting' could be automatic from fluency rather than in ones

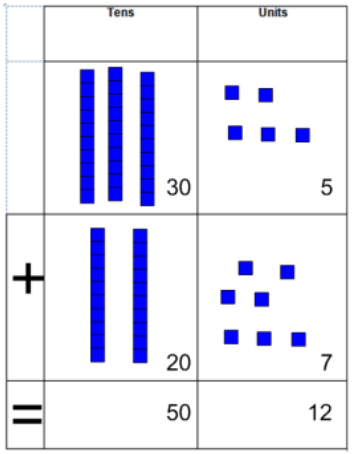
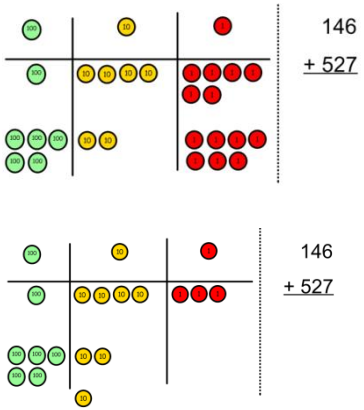
Addition

Year	Strategy/Approach	Concrete	Pictorial	Abstract
Y1	Regrouping to make 10	 6 + 5 = 11  Start with the bigger number and use the smaller number to make 10	 3 + 9 = Use pictures or a number line. Regroup or partition the smaller number to make 10  	9 + 5 = 14 If I am at nine, how many more do I need to make 10? How many more do I need to add on now?
Y2	Adding three single digits	4 + 7 + 6 = 17  Put 4 and 6 together to make 10. Add on 7.  Following on from making 10, make 10 with 2 of the digits (if possible) then add on the third digit.	 Add together three groups of objects. Draw a picture to recombine the groups to make 10.	 Combine the two numbers that make 10 and then add on the remainder. Emphasising the commutative nature/law 4 + 7 + 6 = 17 7 + 4 + 6 = 17 6 + 7 + 4 = 17

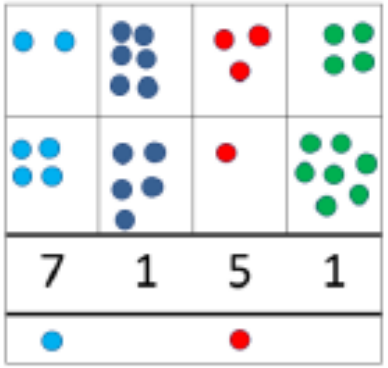
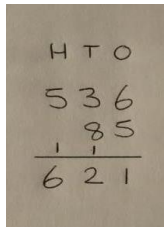
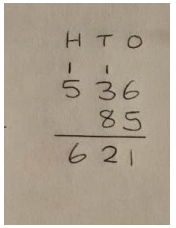
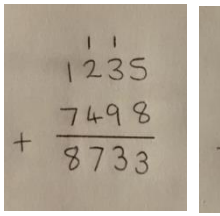
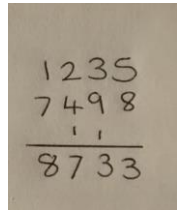
Addition

Year	Strategy/Approach	Concrete	Pictorial	Abstract
Y2	Partitioning	Using Dienes Blocks and Base 10 	This stage will be used by some children.  Use of place value arrow cards can support this.	64 + 32 = 96 4 + 2 = 6 60 + 30 = 90 96 <u>OR</u> 60 + 30 = 90 4 + 2 = 6 96
Y2	Start of the vertical (column) method No exchange required WHEN CALCULATIONS ARE REPRESENTED VERTICALLY WE START WITH THE LEAST SIGNIFICANT DIGITS FIRST.		At this stage pupils can still link this method with partitioning and work with values of ones and tens. Example: 30 + 20 = 50 moving to include the language of 3t + 2t = 5t	24 + 62 = 88 No bridging

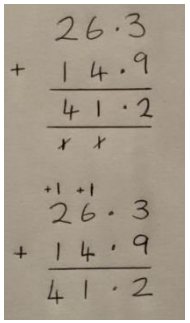
Addition

Year	Strategy/Approach	Concrete	Pictorial	Abstract
Y2	Year 2: TO + TO with exchange (no exchange for expected at Y2 but with exchange for greater depth)	Use a range of apparatus – numicon, straws, beads etc.  	Some pupils will need to make drawings to represent the concrete. App called Number Pieces	Start by partitioning the numbers before moving on to clearly show the exchange below the addition. $20 + 5$ $\underline{40 + 8}$ $60 + 13 = 73$
Y3	Column method- regrouping / exchange Year 3: HTO + HTO (no bridging) HTO + HTO (bridging)	Base 10 still needed at concrete stage, then PV counters if appropriate, then abstract. Begin with ones (always).  	Children can draw a pictoral representation of the columns and place value counters to further support their learning and understanding. The language here needs to refer to the place value column … For the example on the left the commentary includes … 6 ones and 7 ones equals thirteen ones Four tens add two tens plus the extra one	Expanded method - to be shown as an option to bridge understanding between the pictorial and the abstract 536 + 85 11 *(5+6)* 110 *(80 + 30)* 500 *(500)* 621 Contracted method 536 + 85 621 1 1

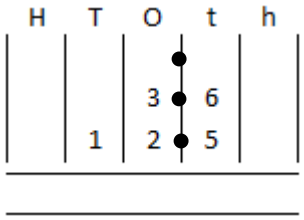
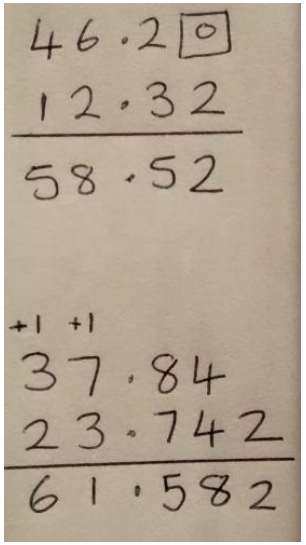
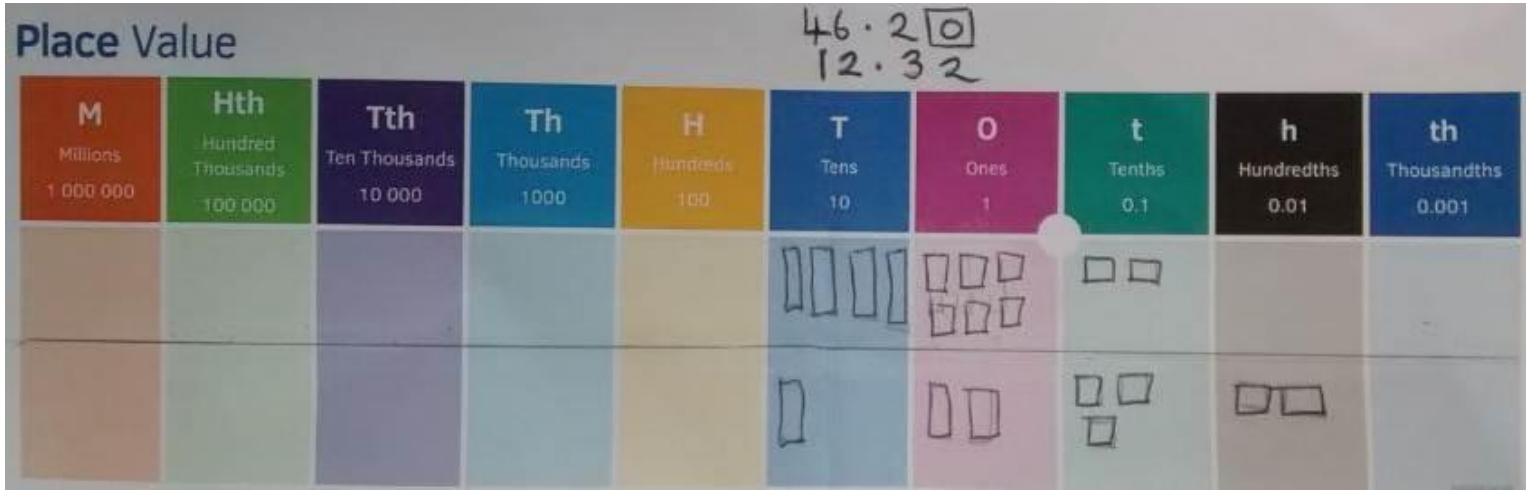
Addition

Year	Strategy/Approach	Concrete	Pictorial	Abstract
Y4	Year 4: ThHTO + ThHTO (no carrying) ThHTO + ThHTO (carrying) Year 4 – need 4 digits + 4 digits (decimals too). Base 10 still needed at concrete stage, then PV counters, then abstract. Begin with ones (always).	Add up the units and exchange 10 ones for one 10.  	The language here needs to refer to the place value column … For the example on the left the commentary includes … 4 ones and 7 ones equals eleven ones Three tens add one ten plus the extra ten Six hundreds and five hundreds equal 11 hundreds etc	    Some children may find place value column headings useful. As the children move on, introduce decimals with the same number of decimal places. Money can be used here.

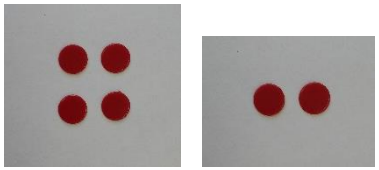
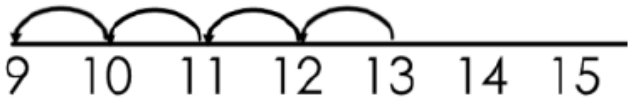
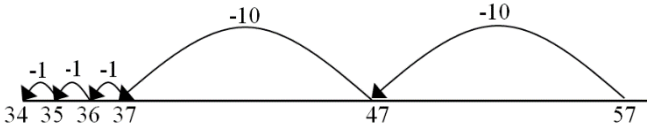
Addition

Year	Strategy/Approach	Concrete	Pictorial	Abstract
Y5	Add decimals to 1 and 2 decimal places	Demonstrate how to exchange across the columns so pupils understand the consistency in relationships in place value including decimals. As children move on to decimals, money and decimal place value counters can be used to support learning. Use money as a way in.	Base 10 for decimals Use of place value counters can support pictorial representation of this.	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

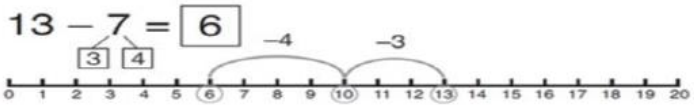
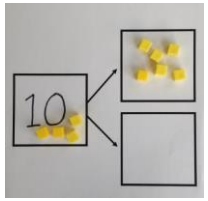
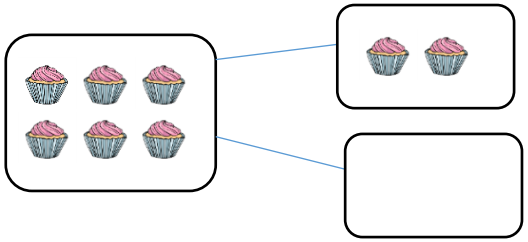
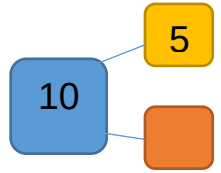
Addition

Year	Strategy/Approach	Concrete	Pictorial	Abstract
Y6	Decimals of differing digits Column method including carrying. Adding decimals of differing digits. H T O 1 10 1 100	Use Dienes or counters in order to show place value. Vocabulary – add, total, sum, carry, exchange 	It may help pupils to include the place value column headings when writing out calculations.	 And carrying below in other ways.
				

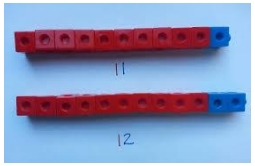
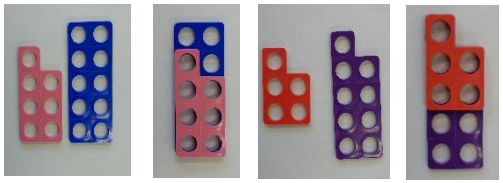
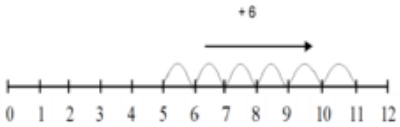
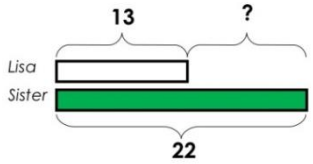
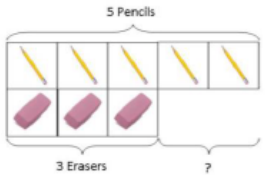
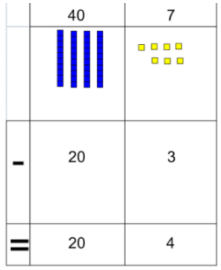
Subtraction

Year	Strategy/Approach	Concrete	Pictorial	Abstract
EYFS	Taking away ones	In a practical context, 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. 	18 -3= 15 8 – 2 = 6 (Consideration is needed as to when to use symbols).
EYFS Y1	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  Use counters and move them away from the group as you take them away counting backwards as you go. 	Count back on a number line or number track.  Start at the bigger number and count back – become more efficient using number facts rather than counting in ones.  Can progress all the way to counting back using two 2 digit numbers. Do taking away tens, before taking away tens and ones.	Put 13 in your head, count back 4. What number are you at? Use your fingers to help initially; then knowledge and fluency in number facts. <u>Y2</u> 57 - 23 57 - 20 - 3 37 - 3 34

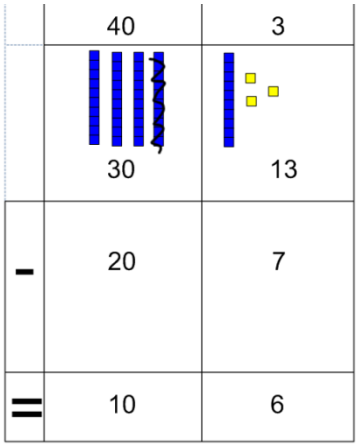
Subtraction

Year	Strategy/Approach	Concrete	Pictorial	Abstract
Y2	Partition numbers to use 10	Calculations below 30 Dienes blocks Base 10	 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 10? How many do we have left to take off?
EYFS Y1 Y2	Part Part Whole Model	 Link to addition - use the part 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.  6 – 2 = ? 6 – ? = 2	 Move to using numbers within the part whole model. 10 – 5 = 5

Subtraction

Year	Strategy/Approach	Concrete	Pictorial	Abstract
Y2	Find the difference	Compare amounts and objects to find the difference.  Use cubes to build towers or make bars 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.  Use basic bar models with items to find the difference.	Hannah has 23 sandwiches, Helen has 15 sandwiches. Find the difference between the numbers of sandwiches.
Y2 Y3	Column method: No need to regroup or exchange	Start with the ones, or smallest value. Don't write T/O above tens/ones when using the value of the whole number for example '40'. 	Pictorial representation of the concrete.	$\begin{array}{rrr} & 40 & 7 \\ - & 20 & 3 \\ \hline & 20 & 4 \\ \hline \end{array}$

Subtraction

Year	Strategy/Approach	Concrete	Pictorial	Abstract
Y2 (greater depth) Y3 Y4	Column method with regrouping or exchange *Initially with two digit numbers* When presenting calculations vertically pupils are taught to start with the least significant digit.		Say the values of the numbers: Forty and five subtract twenty and seven. Five subtract seven – I don't have enough. So I take ten from forty and add it to the five. I now have thirty and fifteen. I now can take seven from fifteen which is eight. Then twenty from thirty which is ten. Connect the place value column: 5 ones subtract 7 ones – I don't have enough so I will exchange a ten from the four tens leaving three tens and 15 ones. Now I have 3 tens subtract 2 tens.	30 15 40 5 - 20 7 10 8 3 1 4 5 - 2 7 1 8

Subtraction

Y3

Column method with regrouping or exchange

Larger numbers

More than one exchange required

Extends to decimals

Year 3:
HTO - HTO (no exchange)

HTO - HTO (exchange)

Y4

Year 4:
ThHTO - ThHTO (one digit exchanging)

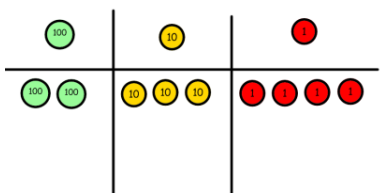
ThHTO - ThHTO (more than one digit exchanging)

Subtract decimals to 1 and then 2 decimal places.

Use Base 10 to start with before moving on to place value counters. Start with one exchange before moving onto subtractions with 2 exchanges.

1

Make the larger number with the place value counters.

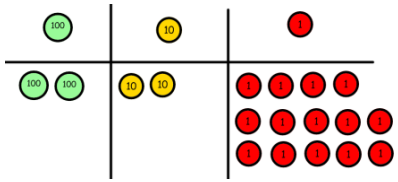


Calculations

2 3 4
- 8 8

2

Start with the ones, can I take away 8 from 4 easily? I need to exchange one of my tens for ten ones.

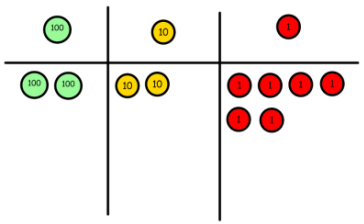


Calculations

2 (1)
2 3 4
- 8 8

3

Now I can subtract my ones.

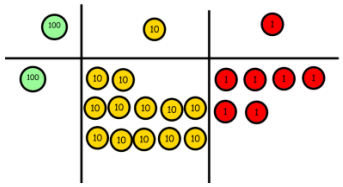


Calculations

2 (1)
2 3 4
- 8 8
6

4

Now look at the tens, can I take away 8 tens easily? I need to exchange one hundred for ten tens.

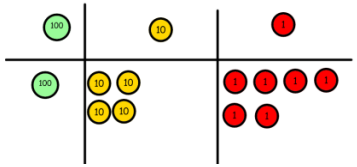


Calculations

1 12 (1)
2 3 4
- 8 8
6

5

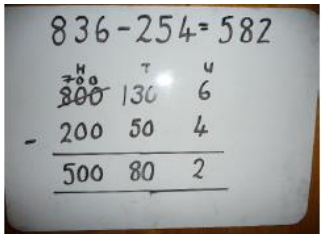
Now I can take away eight tens and complete my subtraction.



Calculations

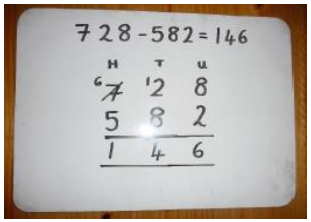
1 12 (1)
2 3 4
- 8 8
1 4 6

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.



Children can start their formal written method by partitioning the number into clear place value columns.

Y4

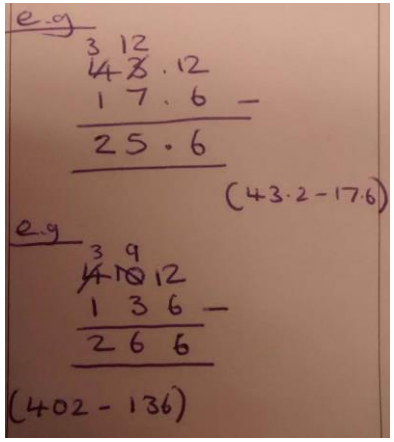
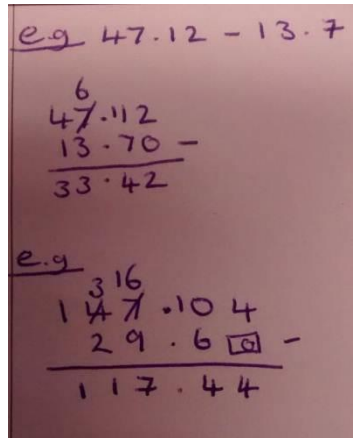


Moving forward the children use a more compact method.

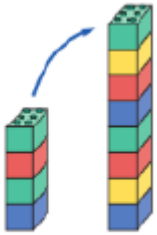
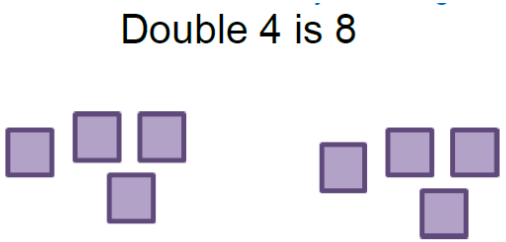
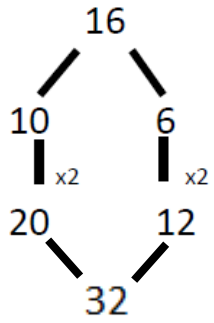
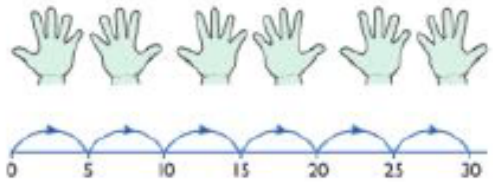
This will lead to an understanding of subtracting any number including decimals.

```
    5  12     1
  2  6  3  .  0
-    2  6  .  5
  2  3  6  .  5
```

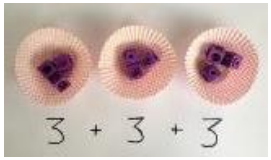
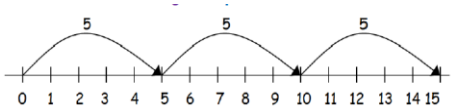
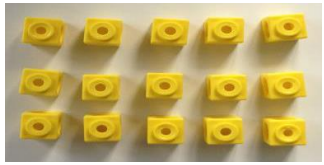
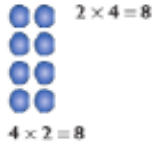
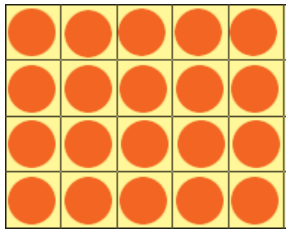
Subtraction

Year	Strategy/Approach	Concrete	Pictorial	Abstract
Y5 Y6	**Further stages in the method** Year 5: Calculations with more than 4 digits including decimals with same number of digits Year 6: Calculations including decimals with different decimal values Ensure vocabulary and language is consistent across year groups – for example, exchange, regroup, steal.		 	
		Some pupils may find it useful to continue with the place value column headings.	43.7 – 3¼ ⟶ 43.70 - 3.25 4 – 3.75 ⟶ 4.00 - 3.75	

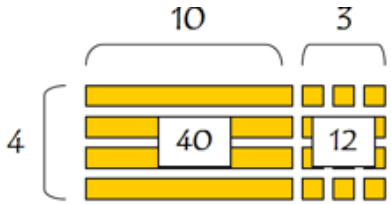
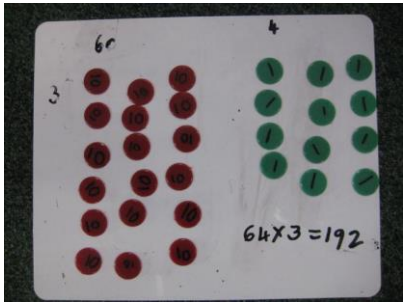
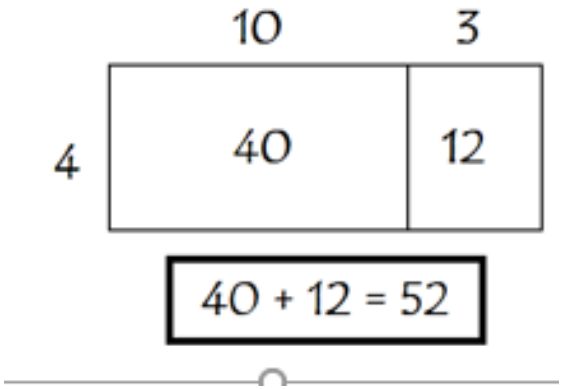
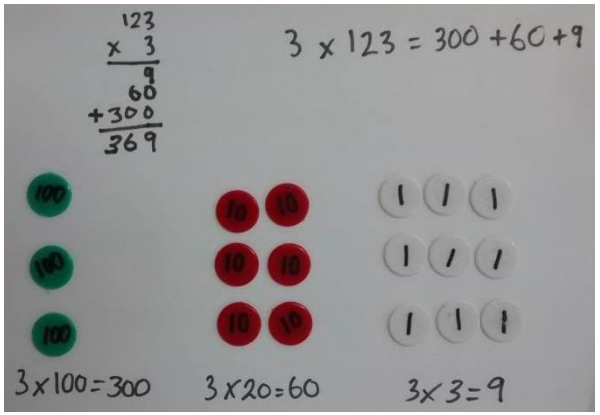
Multiplication

Year	Strategy/Approach	Concrete	Pictorial	Abstract
EYFS Y1 Y2	Doubling	Use practical activities to show how to double a number.  double 4 is 8 4 × 2 = 8	Draw pictures to show how to double a number.  	 Partition a number and then double each part before recombining it back together.
Y1	Counting in multiples	  Count in multiples supported by concrete objects in equal groups. Ensure that pupils do not count in ones.	 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

Multiplication

Year	Strategy/Approach	Concrete	Pictorial	Abstract
Y2	Repeated addition of equal groups	   5 + 5 + 5 Use different objects to recognise and add equal groups.	There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there?  2 add 2 add 2 equals 6  5 + 5 + 5 = 15	Write addition sentences to describe objects and pictures.  2 + 2 + 2 + 2 + 2 = 10
Y2	Arrays – showing commutative multiplication	Create arrays using counters/ cubes to show multiplication sentences.  	Use arrays in different rotations to find **commutative** multiplication sentences.    **4 x 5** **or** **5 x 4** 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

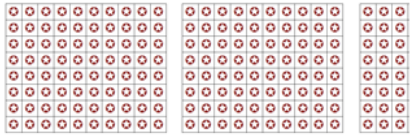
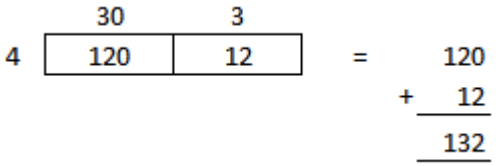
Multiplication

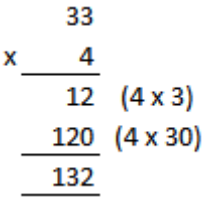
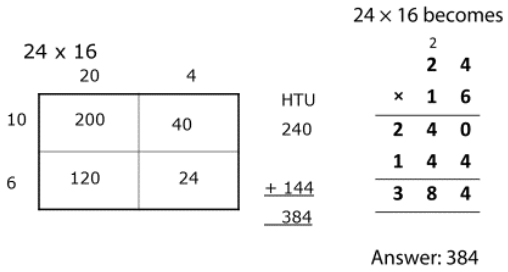
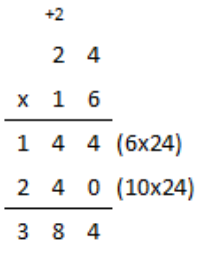
Year	Strategy/Approach	Concrete	Pictorial	Abstract
Y3	Towards column multiplication 2 digits x 1 digit	Children can continue to be supported by place value resources at this stage of multiplication.  		13 x 4 12 40 52 13 x 4 = 52
Y4	Towards column multiplication 2 and 3 digits multiplied by 1 digit			123 x 3 9 60 + 300 369

Multiplication

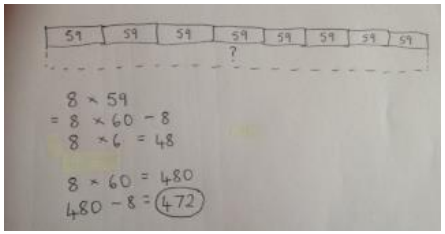
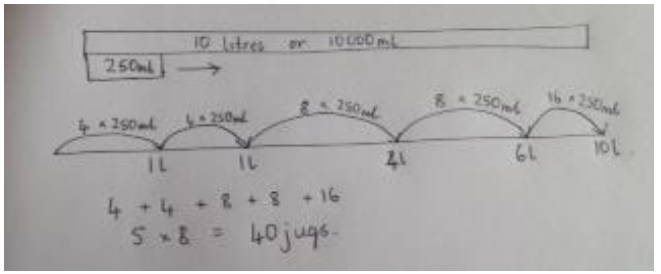
<table>
<tr><th>Year</th><th>Strategy/Approach</th><th>Concrete</th><th>Pictorial</th><th>Abstract</th></tr>
<tr><td>Y3

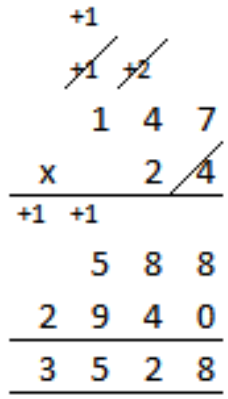
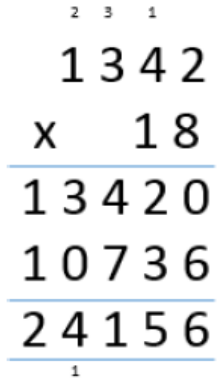
Y4</td><td>Towards column multiplication

Up to 4 digits by 1 digit</td><td>8 x 23
 
8 x 23 = 8 x 10 + 8 x 10 + 8 x 3
= 80 + 80 + 24
= 184</td><td>33 x 4 (grid method)
 

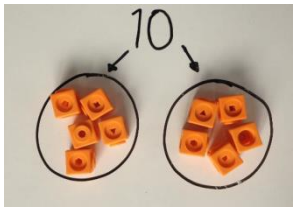
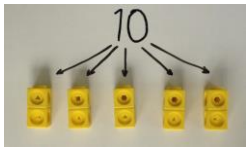
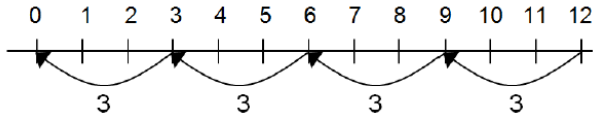
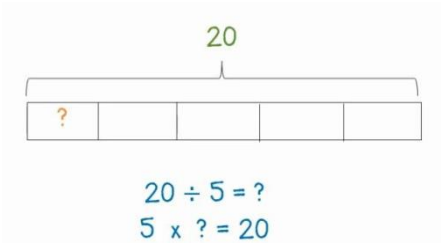
= 120 + 12 = 132</td><td>Expanded
 
</td></tr>
<tr><td>Y5</td><td>Towards column multiplication</td><td colspan="2">Grid towards long multiplication
 
</td><td> 
</td></tr>
</table>

Multiplication

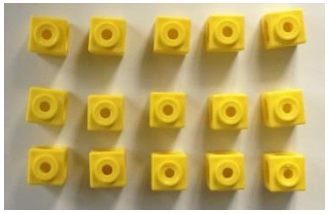
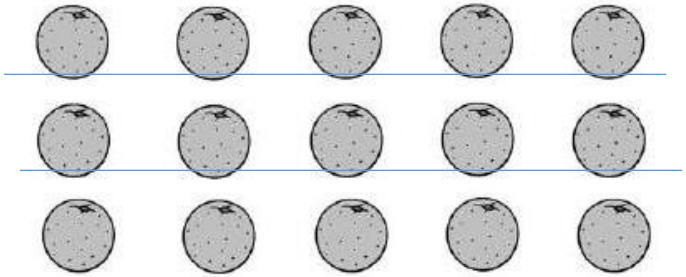
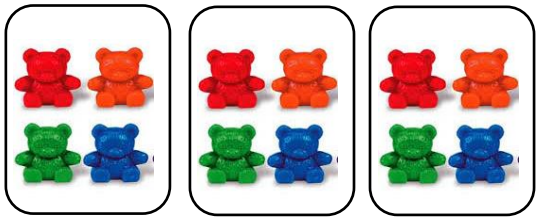
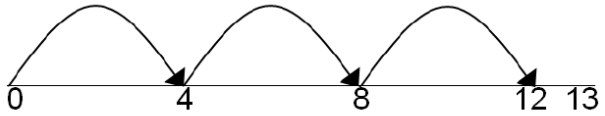
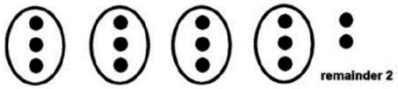
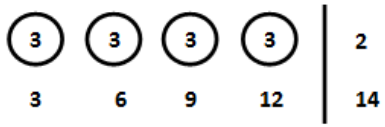
Year	Strategy/Approach	Concrete	Pictorial	Abstract
Y5 Y6	Column multiplication	It is important at this stage that they always multiply the ones first and note down their answer followed by the tens which they note below. **4 x 116 =** 100 10 1 1 1 1 1 1 **4 x 6 = 24** **4 x 10 = 40** **4 x 100 = 400** **4 x 116 = 464** 1 1 6 x 4 2 4 4 0 4 0 0 4 6 4	Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.   HTO x TO 372 x 25 | X	300	70	2	
20	6000	1400	40	**7440**
5	1500	350	10	**+ 1860**	 **= 9300**	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. 32 x 24 8 (4 x 2) 120 (4 x 30) 40 (20 x 2) 600 (20 x 30) 768 7 4 x 6 3 1 2 2 1 0 2 4 0 + 4 2 0 0 4 6 6 2 This moves to the more compact method.

Year	Strategy/Approach	Concrete	Pictorial	Abstract
				
Y6	Column multiplication Pupils using a column must always start from the right			

Division

Year	Strategy/Approach	Concrete	Pictorial	Abstract
EYFS Y1	Sharing objects into equal groups	   I have 10 cubes, can you share them equally in 2 groups?	Children use pictures or shapes to share quantities.  8 ÷ 2 = 4	Share 9 buns between three people. 9 ÷ 3 = 3 Introduce symbols when appropriate
Y1 Y2	Division as grouping Concrete in Y1 Moving to abstract in Y2	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.  How many groups of 2 are in 10? Share 10 into groups of 2 is 5 groups 10 ÷ 2 = 5  How many groups of 5 are in 35? An early step <u>could</u> include this language leading to 'division'!	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. 	28 ÷ 7 = 4 Divide 28 into 7 groups. How many are in each group? 7 14 21 28 28 ÷ 7 = 4 2 4 6 8 10 10 ÷ 2 = 5 Consider in Y1 Expected in Y2

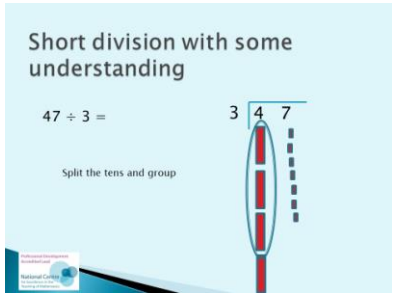
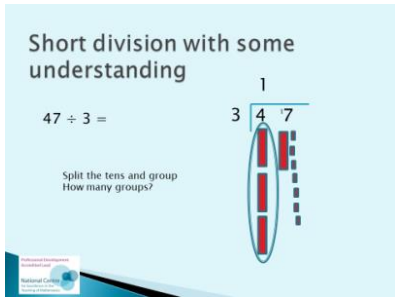
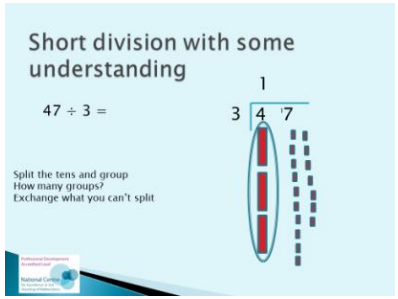
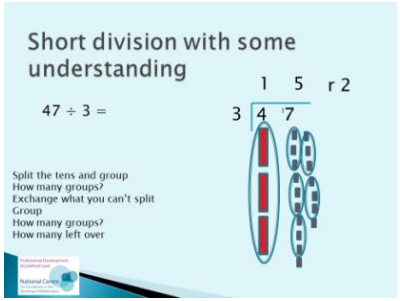
Division

Year	Strategy/Approach	Concrete	Pictorial	Abstract
Y2	Division within 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	 Use and draw an array and use lines to split the array into groups to make multiplication and division sentences.	Find the inverse of multiplication and division sentences by creating four linking number sentences. 7 x 4 = 28 4 x 7 = 28 28 ÷ 7 = 4 28 ÷ 4 = 7
Y2 (greater depth) Y3	Division with a remainder	14 ÷ 3 = Divide objects into equal 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.  Initially draw dots and group them to divide an amount and clearly show a remainder.  remainder 2 Develop to more efficient recording as below.  3 3 3 3 | 2 3 6 9 12 | 14	Complete written divisions and show the remainder using r.  29 ÷ 8 = 3 REMAINDER 5 dividend divisor quotient remainder

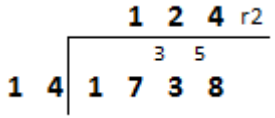
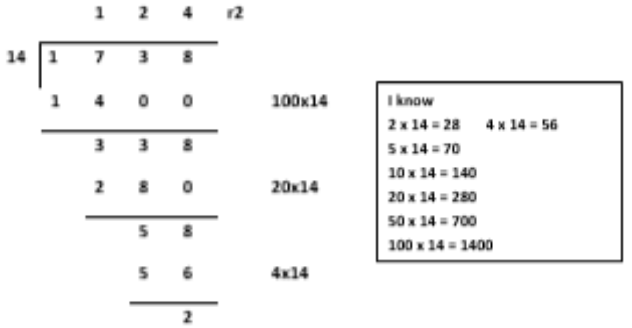
Division

Year	Strategy/Approach	Concrete	Pictorial	Abstract
Y3	Start of chunking which develops to become more efficient Consider introducing the short division method		**13 divided by 4** 4 ⟌ 13 ●●●● − 4 = 9 ●●●● − 4 = 5 ●●●● − 4 = ● 1 "Can I make a group of 4?" "Can I make another group of 4?" 4 ⟌ 13 - 12 1	It is important to develop efficiency. 21 ÷ 4 = 5 r 1 5 r 1 4 ⟌ 21 - 4 (1 x 4) → 17 - 4 (1 x 4) → 13 - 4 (1 x 4) → 9 - 4 (1 x 4) → 5 - 4 (1 x 4) → 1 □ Becoming more efficient and progressing to: 5 r 1 4 ⟌ 21 - 20 (5 x 4) 1
Y4	Division with a remainder/as a fraction	Short division becoming more efficient i.e. subracting in larger chunks.	24 divided by 5 0 4 r4 5 ⟌ 2 4 2 OR 0 4 4/5 5 ⟌ 2 4 2	12 6 ⟌ 72 -60 (10 x) 12 -12 (2 x) 0

Division

Year	Strategy/Approach	Concrete	Pictorial	Abstract
Y3 Y4	Division with regrouping / exchange is introduced in Y3/Y4	Base 10 – dienes Practical modelling of the example in the next column. Consider modelling process with smaller numbers to develop understanding.	   	98 ÷ 7 becomes 1 4 7 9 8 2 Answer: 14 432 ÷ 5 becomes 8 6 r 2 5 4 3 2 3 Answer: 86 remainder 2 496 ÷ 11 becomes 4 5 r 1 1 1 4 9 6 5 Answer: $45\frac{1}{11}$
Y5	Dividing up to 4 digits by a single digit using short division			

Division

Year	Strategy/Approach	Concrete	Pictorial	Abstract
	Short division with larger numbers		Some children would benefit from the 'I Know' box.	
Y5 Y6	Dividing 4 digits by 2 digits using long division		1738 ÷ 14  Division method can be used for higher values using the 'I Know' box. This will aid efficiency which is required as exemplified in the National Curriculum appledix.	'I Know' boxes are used to find efficient answers e.g. first subtraction when dividing hundreds are likely to be hundreds/tens.

Appendix A – Progression in Difficulty in Calculations

ADDITION	**SUBTRACTION**
1. No exchange 2. Extra digit in the answer 3. Exchanging ones to tens 4. Exchanging tens to hundreds 5. Exchanging ones to tens and tens to hundreds 6. More than two numbers in calculation 7. As 6 but with different number of digits 8. Decimals up to 2 decimal places (same number of decimal places) 9. Add two or more decimals with a range of decimal places	1. No exchange 2. Fewer digits in the answer 3. Exchanging tens for ones 4. Exchanging hundreds for tens 5. Exchanging hundreds to tens and tens to ones 6. As 5 but with different number of digits 7. Decimals up to 2 decimal places (same number of decimal places) 8. Subtract two or more decimals with a range of decimal places
SHORT MULTIPLICATION	**SHORT DIVISION**
1. TO x O no exchange 2. TO x O extra digit in the answer 3. TO x O with exchange of ones into tens 4. HTO x O no exchange 5. HTO x O with exchange of ones into tens 6. HTO x O with exchange of tens into hundreds 7. HTO x O with exchange of ones into tens and tens into hundreds 8. As 4-7 but with greater number digits x O 9. O.t x O no exchange 10. O.t with exchange of tenths to ones 11. As 9 - 10 but with greater number of digits which may include a range of decimal places x O	1. TO ÷ O no exchange no remainder 2. TO ÷ O no exchange with remainder 3. TO ÷ O with exchange no remainder 4. TO ÷ O with exchange, with remainder 5. Zero in the quotient e.g. 816 ÷ 4 = **204** 6. As 1-5 HTO ÷ O 7. As 1-5 greater number of digits ÷ O 8. As 1-5 with a decimal dividend e.g. 7.5 ÷ 5 or 0.12 ÷ 3 9. Where the divisor is a two-digit number <u>Remainders</u> 1. Whole number remainder 2. Remainder expressed as a fraction of the divisor 3. Remainder expressed as a simplified fraction 4. Remainder expressed as a decimal