Barcombe Hamsey Plumpton
Skylark Federation

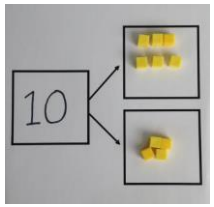
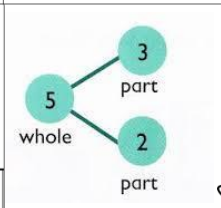
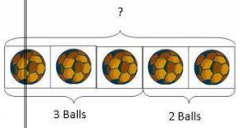
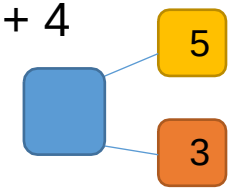
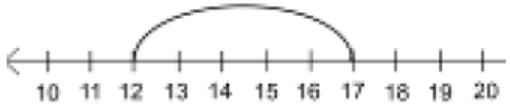
Calculations Policy

Reviewed and approved by FGB: 03.02.23

Review: Spring 2026

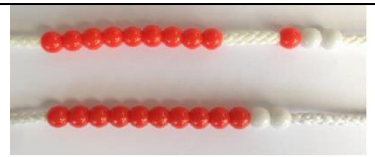
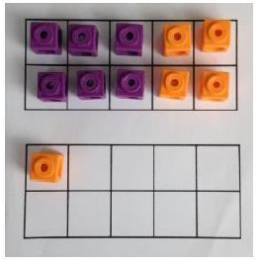
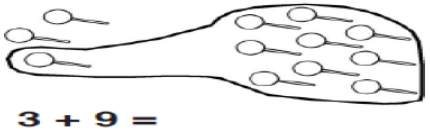
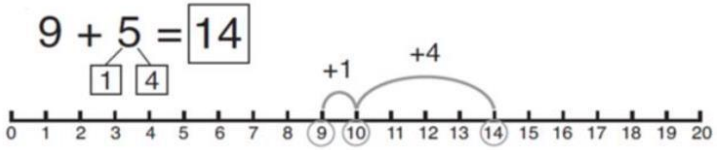
Progression in Calculations

Addition

Objective and Strategies	Concrete	Pictorial	Abstract
Combining two parts to make a whole: part-whole model EYFS – up to 10 Yr 1 – up to 20 Yr 2 – reminder at the beginning of the year **NNC benefits:** will support KS1 children in 'counting to 100' with secure knowledge of number bonds to 10	   Use cubes to add two numbers together as a group or in a bar. *Use **numicon** to reinforce ideas*  	    Use pictures to add two numbers together as a group or in a bar. 	4 + 3 = 7 10= 6 + 4  Use the part-part whole diagram as shown above to move into the abstract.
Starting at the bigger number and counting on EYFS/Yr 1/Yr 2 – differentiate size of number. Encourage independence among Yr 2 – provide with blank number line. Identify one more/less	 Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.  Put the larger number in your head and use numicon to add on the smaller number.	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.

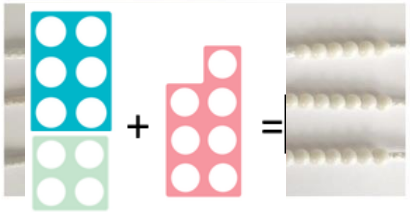
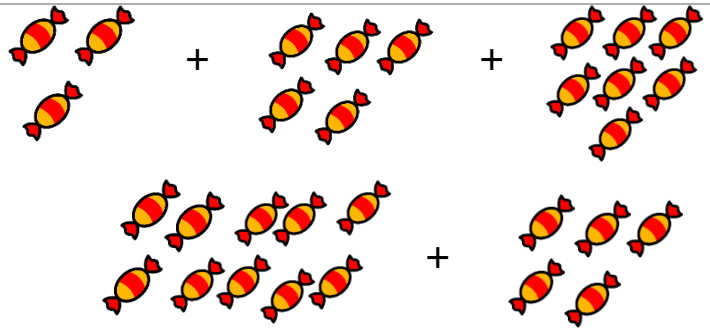
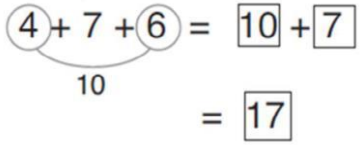
<table>
<tr>
<td>Regrouping to make 10.

Yr 1/Yr 2 – differentiate numbers accordingly.

Support children in using language such as: equal to, more than, less than, most, least.</td>
<td> 
6 + 5 = 11
 
Start with the bigger number and use the smaller number to make 10.</td>
<td> 
3 + 9 =
Use pictures or a number line. Regroup or partition the smaller number to make 10.
 
</td>
<td>7 + 4= 11

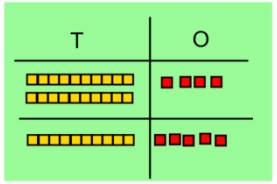
If I am at seven, how many more do I need to make 10. How many more do I add on now?</td>
</tr>
<tr>
<td>Adding three single digits

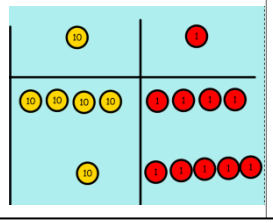
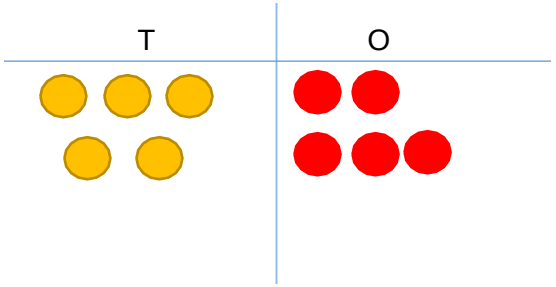
Yr 2 – adding 3 one digit numbers together → leading to two-digit number and ones

Adding 3 one digit numbers together → leading to two-digit number and ones</td>
<td>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.</td>
<td> 
Add together three groups of objects. Draw a picture to recombine the groups to make 10.</td>
<td> 

Combine the two numbers that make 10 and then add on the remainder.</td>
</tr>
<tr>
<td>Column method- no regrouping

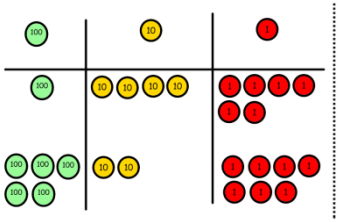
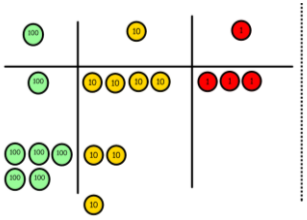
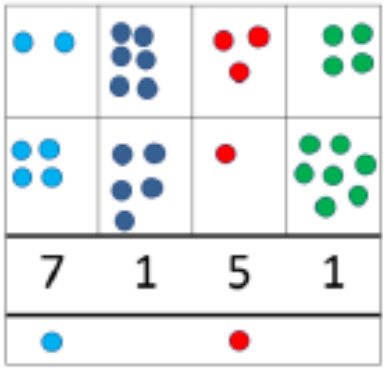
Yr 2 – supports commutativity. Adding two two-digit numbers.

Yr 3 – 2x 3 digit numbers.</td>
<td>24 + 15=
Add together the ones first then add the tens. Use the Base 10 blocks first before moving onto place value counters.
 

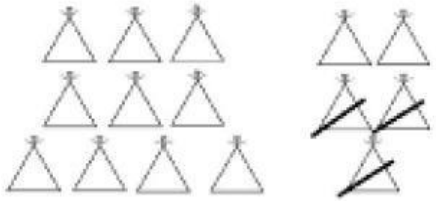
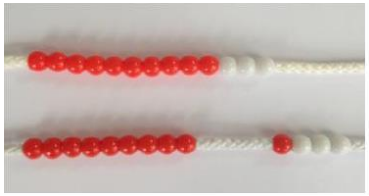
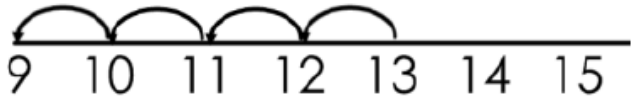
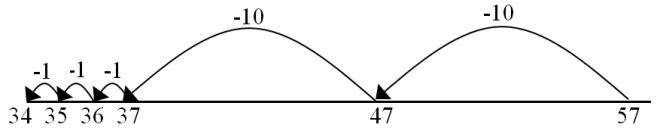
  </td>
<td>After practically using the base 10 blocks and place value counters, children can draw the counters to help them to solve additions.
 
</td>
<td>Calculations

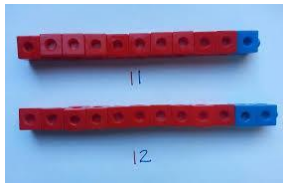
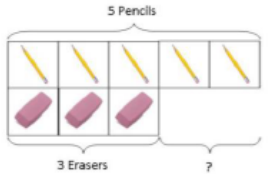
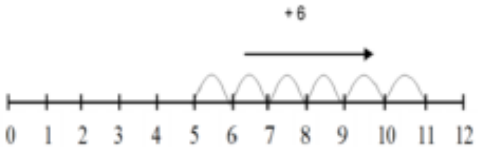
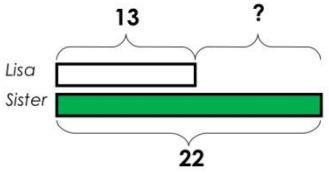
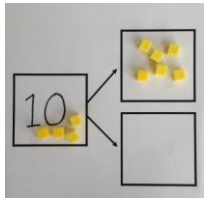
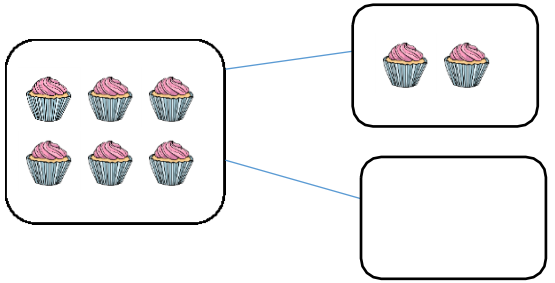
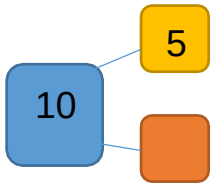
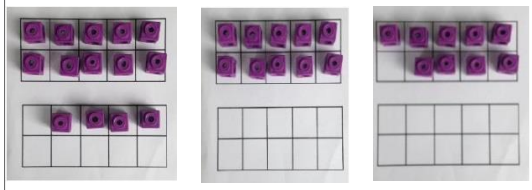
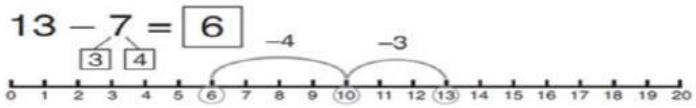
21 + 42 =

21
+ 42</td>
</tr>
</table>

Column method- regrouping Yr 3 – supports children's understanding of place value → 10 tens = 1 100. Yr 4 – as above with 4 digit numbers. Year 5/6 – contraction method (see abstract) for whole and decimal numbers.	Make both numbers on a place value grid.  146 + 527 Add up the units and exchange 10 ones for one 10.  146 + 527 Add up the rest of the columns, exchanging the 10 counters from one column for the next place value column until every column has been added. This can also be done with Base 10 to help children clearly see that 10 ones equal 1 ten and 10 tens equal 100. As children move on to decimals, money and decimal place value counters can be used to support learning.	Children can draw a pictoral representation of the columns and place value counters to further support their learning and understanding.  	Start by partitioning the numbers before moving on to clearly show the exchange below the addition. 20 + 5 40 + 8 60 + 13 = 73 As the children move on, introduce decimals with the same number of decimal places and different. Money can be used here. 536 + 85 621 1 1 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

Subtraction

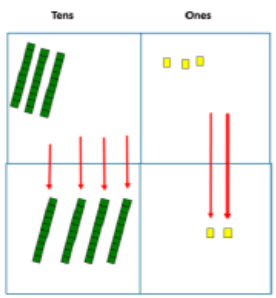
Objective and Strategies	Concrete	Pictorial	Abstract
Taking away ones EYFS – up to 10 Yr 1 – up to 20 Represent and use number bonds and related subtraction facts within 20. Add and subtract one-digit and two-digit numbers to 20, including zero.	Use physical objects, counters, cubes, numicon etc to show how objects can be taken away.  6 – 2 = 4  	Cross out drawn objects to show what has been taken away.  15 – 3 = 12	18 -3= 15 8 – 2 = 6
Counting back EYFS – up to 10 Yr 1 – up to 20 Yr 2 – up to 100 Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100	Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones.  13 – 4 Use counters and move them away from the group as you take them away counting backwards as you go. 	Count back on a number line or number track  9 10 11 12 13 14 15 Start at the bigger number and count back the smaller number showing the jumps on the number line.  -1 -1 -1 -10 -10 34 35 36 37 47 57 This can progress all the way to counting back using two 2 digit numbers.	Put 13 in your head, count back 4. What number are you at? Use your fingers to help.

Find the difference Yr 1 – up to 20 Yr 2 – up to 100	Compare amounts and objects to find the difference.  Use cubes to build towers or make bars to find the difference  Use basic bar models with items to find the difference	 Count on to find the difference. Draw bars to find the difference between 2 numbers. **Comparison Bar Models** *Lisa is 13 years old. Her sister is 22 years old. Find the difference in age between them.*  	Hannah has 23 sandwiches, Helen has 15 sandwiches. Find the difference between the number of sandwiches.
Part Part Whole Model Yr 1 – up to 20 Yr 2 – up to 100	 Link to addition- use the part whole model to help explain the inverse between addition and subtraction. If 10 is the whole and 6 is one of the parts. What is the other part? 10 - 6 =	Use a pictorial representation of objects to show the part part whole model. 	 Move to using numbers within the part whole model.
Make 10 Yr 1 – up to 20 Yr 2 – up to 100, relating to understanding of 10	14 – 9 =  Make 14 on the ten frame. Take away the four first to make 10 and then takeaway one more so you have taken away 5. You are left with the answer of 9.	 Start at 13. Take away 3 to reach 10. Then take away the remaining 4 so you have taken away 7 altogether. You have reached your answer.	16 – 8= How many do we take off to reach the next 10? How many do we have left to take off?

Column method without regrouping

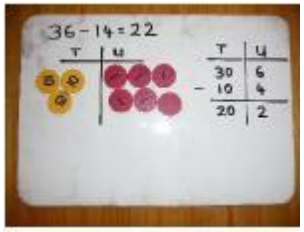
Yr 2 –Subtracting two two-digit numbers.

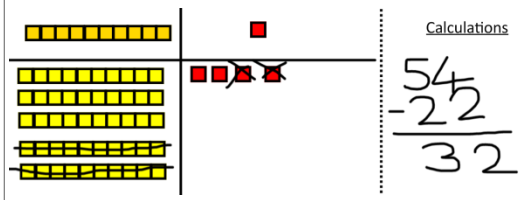
Yr 3 – 2x 3 digit numbers

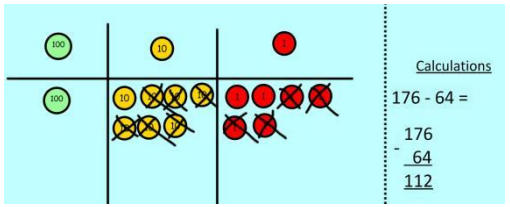


Use Base 10 to make the bigger number then take the smaller number away.

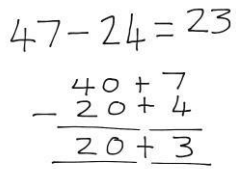
Show how you partition numbers to subtract. Again make the larger number first.



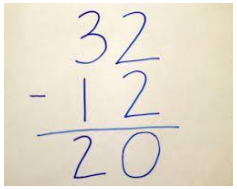




Draw the Base 10 or place value counters alongside the written calculation to help to show working.



This will lead to a clear written column subtraction.



Column method with regrouping

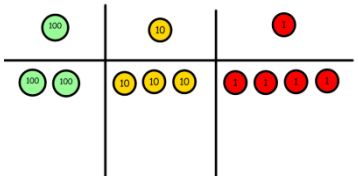
Yr 3 – supports children's understanding of place value → 10 tens = 1 100.

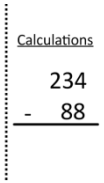
Yr 4 – as above with 4 digit numbers.

Year 5/6 – contraction method (see abstract) for whole and decimal numbers

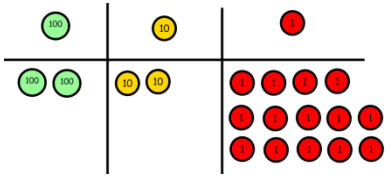
Use Base 10 to start with before moving on to place value counters. Start with one exchange before moving onto subtractions with 2 exchanges.

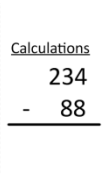
Make the larger number with the place value counters

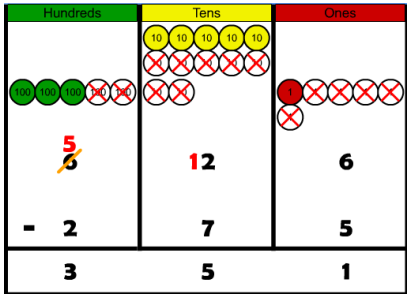




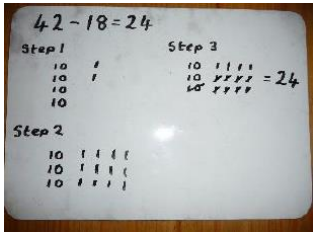
Start with the ones, can I take away 8 from 4 easily? I need to exchange one of my tens for ten ones.





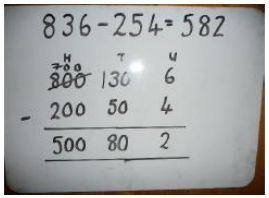


Draw the counters onto a place value grid and show what you have taken away by crossing the counters out as well as clearly showing the exchanges you make.

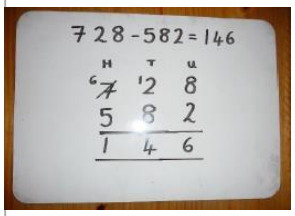


When confident, children can find their own way to record the exchange/regrouping.

Just writing the numbers as shown here shows that the child understands the method and knows when to exchange/regroup.

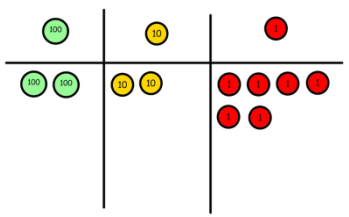


Children can start their formal written method by partitioning the number into clear place value columns.



Moving forward the children use a more compact method.

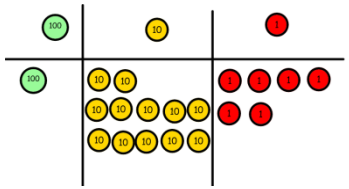
Now I can subtract my ones.



Calculations

234
- 88

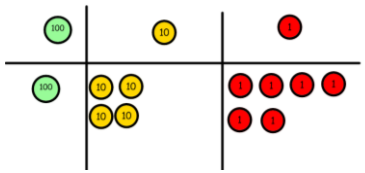
Now look at the tens, can I take away 8 tens easily? I need to exchange one hundred for ten tens.



Calculations

234
- 88

Now I can take away eight tens and complete my subtraction



Calculations

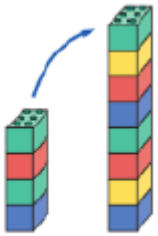
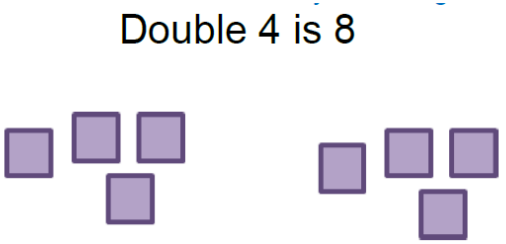
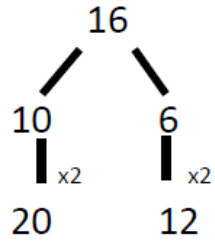
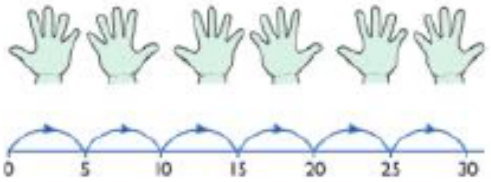
~~2~~ ~~3~~4
- 88
146

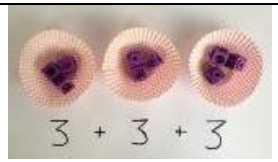
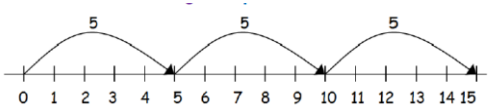
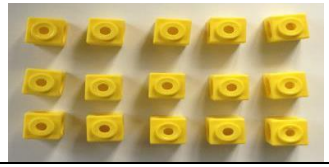
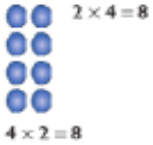
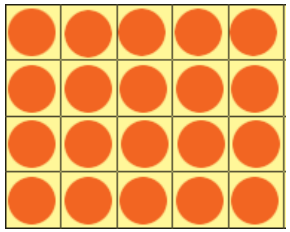
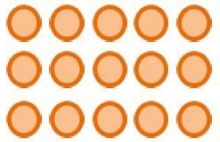
Show children how the concrete method links to the written method alongside your working. Cross out the numbers when exchanging and show where we write our new amount.

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

$$\begin{array}{r} {\scriptstyle 5\ 12\ \ \ 1} \\ 2\ \cancel{6}\ \cancel{3}\ .\ \mathbf{0} \\ -\ \ 2\ 6\ .\ 5 \\ \hline 2\ 3\ 6\ .\ 5 \end{array}$$

Multiplication

Objective and Strategies	Concrete	Pictorial	Abstract
Doubling EYFS/Yr 1 – make connections between arrays, number patterns, counting in twos, fives and tens. Yr 2 – abstract – supports conception of commutativity	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.
Counting in multiples EYFS – see concrete Yr 1 – grouping and combining groups using concrete apparatus Yr 2 – count on in 2, 5, 10	  Count in multiples supported by concrete objects in equal groups.	 Use a number line or pictures to continue support in counting in multiples.	Count in multiples of a number aloud. Write sequences with multiples of numbers. 2, 4, 6, 8, 10 5, 10, 15, 20, 25 , 30

Repeated addition Yr 1 – supports in adding 3 1 digit numbers Yr 2 recognise inverse relationship e.g. 5 x 4 = 20. 20 shared by 4 = 5.	   Use different objects to 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. 
Arrays-showing commutative multiplication Yr 2 – understand commutativity → develop multiplicative reasoning. Work with a range of materials and contexts in which multiplication and division relate to grouping & sharing	Create arrays using counters/ cubes to show multiplication sentences.  	Draw arrays in different rotations to find **commutative** multiplication sentences.    Link arrays to area of rectangles.	Use an array to write multiplication sentences and reinforce repeated addition.  5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15 5 x 3 = 15 3 x 5 = 15

Grid Method

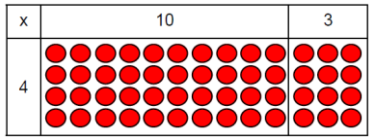
Yr 3 – reinforces place value of each number in a 3 digit number.

Call it P-M-C → partition, multiply, combine.

Yr 4 – begin with this method to reinforce place value understanding. Move onto contraction method towards end of Yr 4.

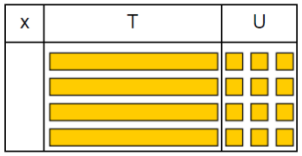
Pupils develop reliable written methods for multiplication and division, starting with calculations of two-digit by one-digit numbers progressing to the formal written methods for...multiplication.

Show the link with arrays to first introduce the grid method.



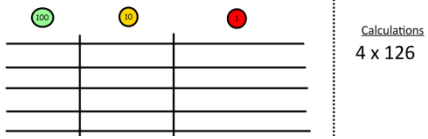
4 rows of 10
4 rows of 3

Move on to using Base 10 to move towards a more compact method.

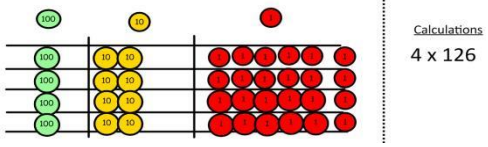


4 rows of 13

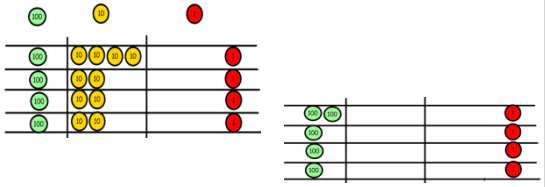
Move on to place value counters to show how we are finding groups of a number.We are multiplying by 4 so we need 4 rows.



Fill each row with 126.



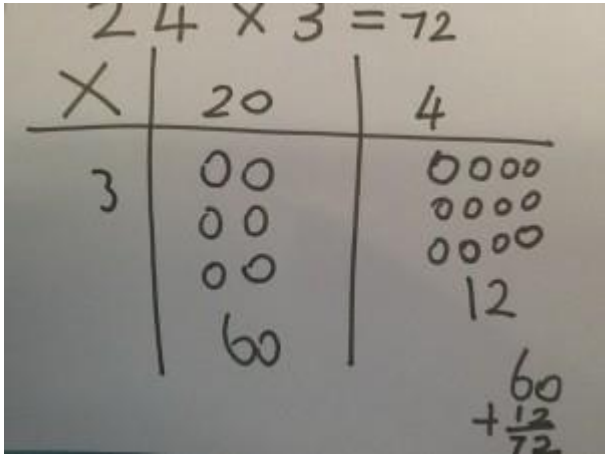
Add up each column, starting with the ones making any exchanges needed.



Then you have your answer.

Children can represent the work they have done with place value counters in a way that they understand.

They can draw the counters, using colours to show different amounts or just use circles in the different columns to show their thinking as shown below.



Start with multiplying by one digit numbers and showing the clear addition alongside the grid.

×	30	5
7	210	35

210 + 35 = 245

Moving forward, multiply by a 2 digit number showing the different rows within the grid method.

	10	8
10	100	80
3	30	24

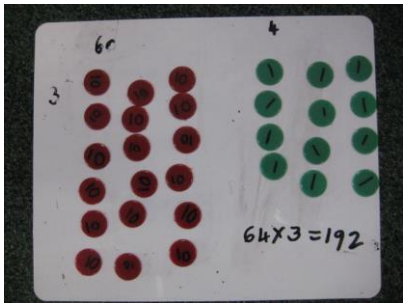
X	1000	300	40	2
10	10000	3000	400	20
8	8000	2400	320	16

Column multiplication

Yr 4 – introduce at the end with ‘number sentence’ or ‘number sum’ in brackets next to the column.

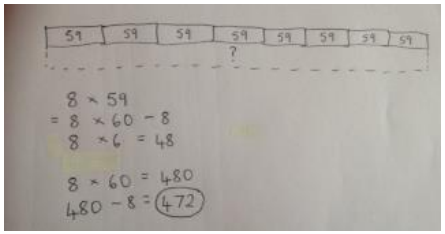
Yr 5/6 – compact long multiplication method, following concrete reminder in T1/2 of academic year (see concrete column).

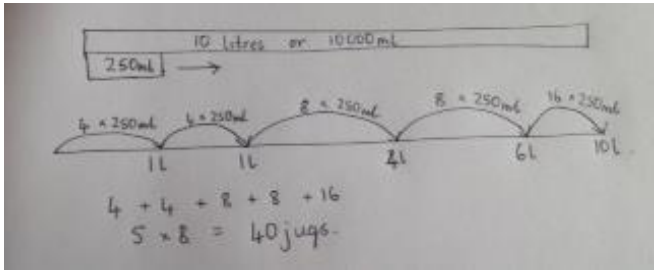
Children can continue to be supported by place value counters at the stage of multiplication.



It is important at this stage that they always multiply the ones first and note down their answer followed by the tens which they note below.

Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.





Start with long multiplication, reminding the children about lining up their numbers clearly in columns.

If it helps, children can write out what they are solving next to their answer.

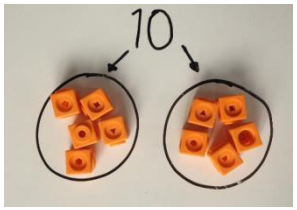
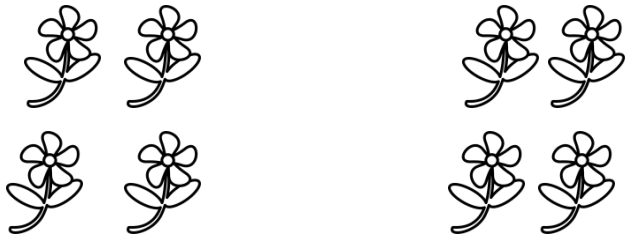
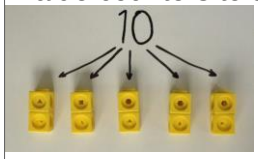
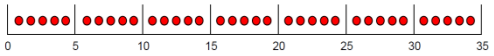
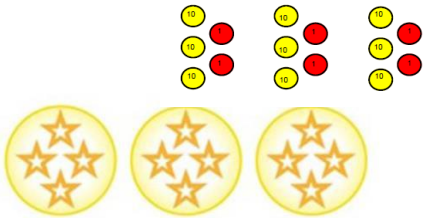
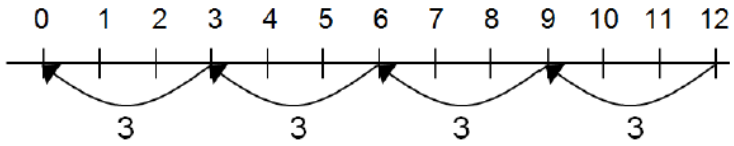
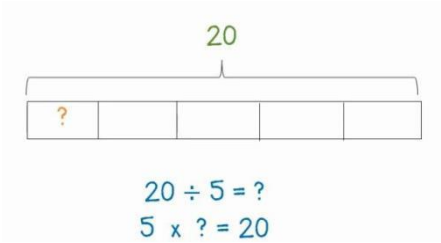
```
  32
x 24
  8    (4 x 2)
 120   (4 x 30)
  40   (20 x 2)
 600   (20 x 30)
 768
```

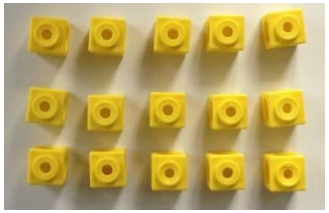
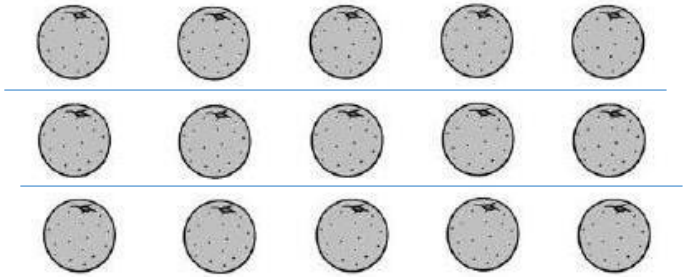
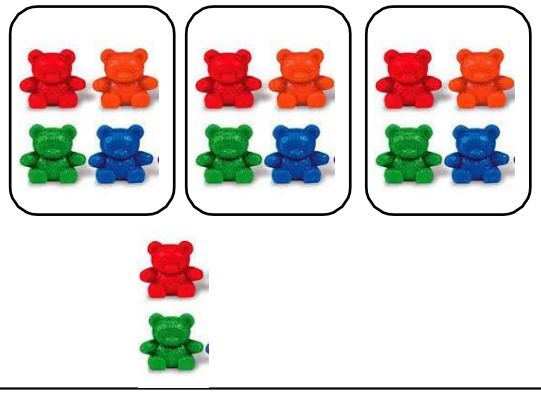
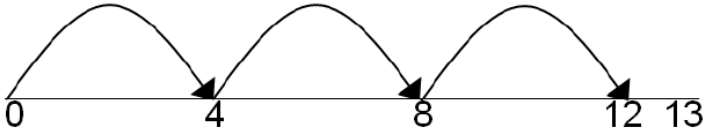
```
    74
  x 63
  ----
    12
   210
   240
+ 4200
  ----
  4662
```

This moves to the more compact method.

```
  2 3  1
  1342
x   18
-------
 13420
 10736
-------
 24156
-------
  1
```

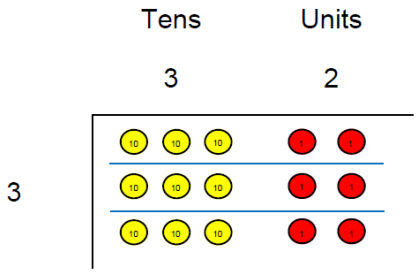
Division

Objective and Strategies	Concrete	Pictorial	Abstract
Sharing objects into groups EYFS – see concrete Yr 1 – grouping and combining groups using concrete apparatus Yr 2 – reminder at the beginning of Yr2	   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
Division as grouping EYFS – see concrete. See ELG objectives. Yr 1 – begin with concrete. Singapore introduces understanding of reversibility. Yr 2 – Singapore bar method to reinforce concept of commutativity.	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.   96 ÷ 3 = 32 	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?

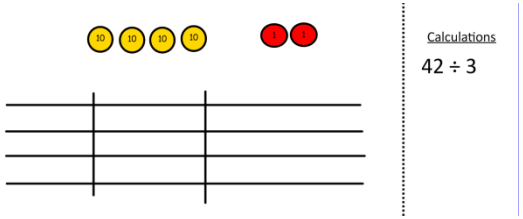
Division within arrays Yr 1/2 – develop multiplicative reasoning using commutativity and inverse relationships.	 Link division to multiplication by creating an array and thinking about the number sentences that can be created. Eg 15 ÷ 3 = 5 5 x 3 = 15 15 ÷ 5 = 3 3 x 5 = 15	 Draw an array and use lines to split the array into groups to make multiplication and division sentences.	Find the inverse of multiplication and division sentences by creating four linking number sentences. 7 x 4 = 28 4 x 7 = 28 28 ÷ 7 = 4 28 ÷ 4 = 7
Division with a remainder Yr 2/3 – Concrete and pictorial used in Yr 2 to elicit understanding of problems in context. Year 3 made aware of mathematical vocabulary in abstract column.	14 ÷ 3 = Divide objects between groups and see how much is left over 	Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.  Draw dots and group them to divide an amount and clearly show a remainder. 	Complete written divisions and show the remainder using r. 

Short division

Yr 3/4 – pupils practise to become fluent in the formal written method for short multiplication and short division with exact answers.

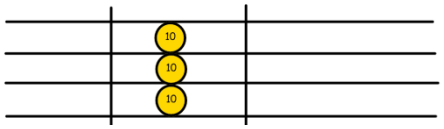


Use place value counters to divide using the bus stop method alongside

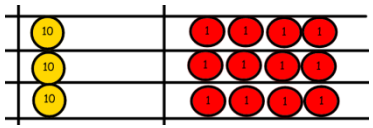


42 ÷ 3=

Start with the biggest place value, we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over.

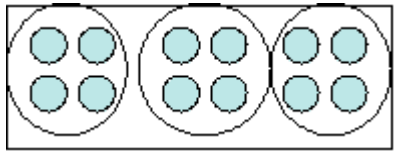


We exchange this ten for ten ones and then share the ones equally among the groups.



We look how much in 1 group so the answer is 14.

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.

$$\begin{array}{r} 218 \\ 4\overline{)872} \\ \underline{3} \end{array}$$

Move onto divisions with a remainder.

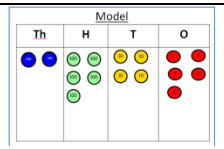
$$\begin{array}{r} 86\ r\ 2 \\ 5\overline{)432} \\ \underline{3} \end{array}$$

Finally move into decimal places to divide the total accurately.

$$\begin{array}{r} 14.6 \\ 35\overline{)511.0} \\ \underline{16} \\ 21 \end{array}$$

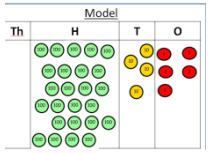
Long division

Yr 5/6 – divide numbers to 4 digits by a 2 digit whole number using formal written written method for long division. Begin with concrete to support reinforcement of place value.



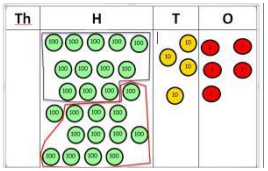
2544 ÷ 12
How many groups of 12 thousands do we have?
None

Exchange 2 thousand for 20 hundreds.



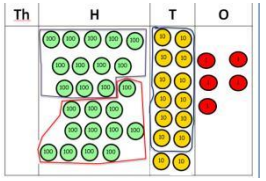
$$12\overline{)2544}\quad 0$$

How many groups of 12 are in 25 hundreds? 2 groups. Circle them.
We have grouped 24 hundreds so can take them off and we are left with one.



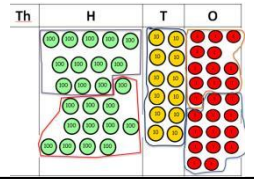
$$12\overline{)2544}\quad 02\ (24)\ 1$$

Exchange the one hundred for ten tens so now we have 14 tens. How many groups of 12 are in 14? 1 remainder 2



$$12\overline{)2544}\quad 021\ (24)\ 14\ 12\ 2$$

Exchange the two tens for twenty ones so now we have 24 ones. How many groups of 12 are in 24? 2



$$12\overline{)2544}\quad 0212\ (24)\ 14\ 12\ (24)\ 0$$

Instead of using physical counters, students can draw the counters and circle the groups on a whiteboard or in their books.

Use this method to explain what is happening and as soon as they have understood what move on to the abstract method as this can be a time consuming process.

$$20\overline{)6365}\quad 0318\ r5$$

-60

36

-20

165

-160

5