



Heatherley Primary School

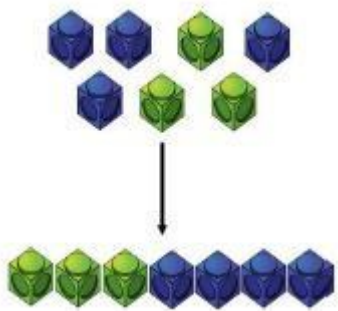
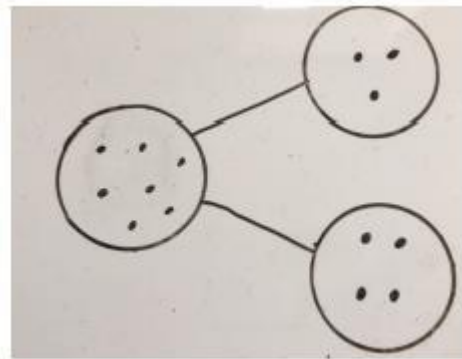
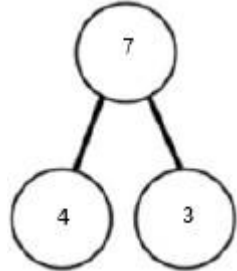
Maths Calculation Policy.

Reviewed September 2025

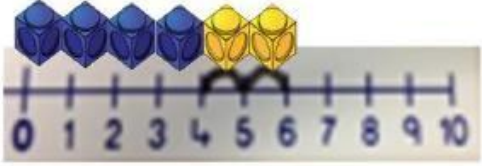
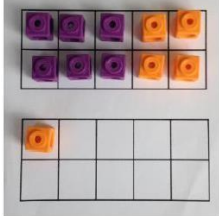
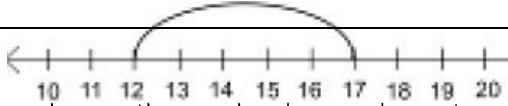
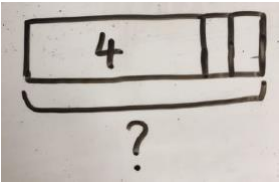
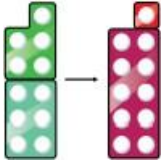
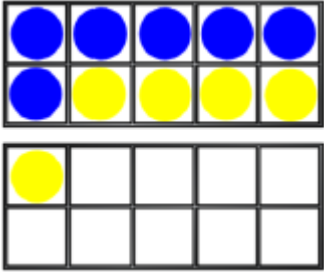
Subject Coordinator: F.Brock

Addition

Key Language: sum, total parts and wholes, plus, add, altogether, more, 'is equal to' 'is the same as'.

Objective and Strategies	Concrete	Pictorial	Abstract
Combining two parts to make a whole: part-whole model	Combining two parts to make a whole (use other resources too. e.g. eggs, shells, teddy bears, cars..) 	Children to represent the cubes using dots or crosses. They could put each part on a part whole model too. 	$4 + 3 = 7$ Four is a part, 3 is a part and the whole is seven. 

Progression in Calculations

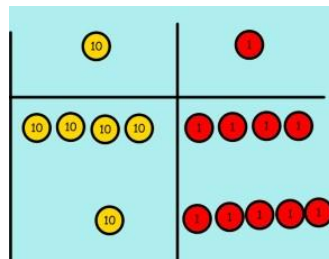
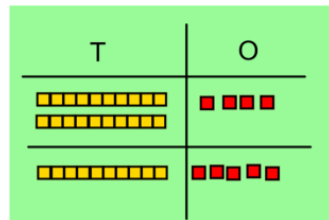
Counting on using number lines	Counting on using number lines using for example cubes or other counters above the line.  	$12 + 5 = 17$  Start at the larger number on the number line and count on in ones or in one jump to find the answer.  Use of a bar model which encourages the children to count on, rather than to count all.	Children use mental strategies to count on and then record the number sentence. What is 2 more than 4? What is the sum of 2 and 4? What is the total of 4 and 2? $4 + 2$
Regrouping to make 10.	Regrouping to make 10 using ten frames and for example counters/cubes or using Numicon. $6 + 5 = 11$  Start with the bigger number and use the smaller number to make 10.	Children to draw the ten frame and counters/cubes. 	Children visualise regrouping mentally and form the number sentence. $6 + 5 = 10 + 1 = 11$ $= 5 + 1 + 5 = 11$ $7 + 6 = 10 + 3 = 13$

Progression in Calculations

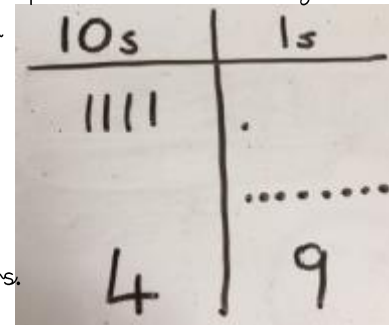
TO+O -
Column
method- no
regrouping

$$24 + 15 =$$

Add together the ones first then add the tens. Use the Base 10 blocks first before moving onto place value counters.



After practically using the base 10 blocks and place value counters, children can draw the counters to help them to solve additions. Children to represent the base 10 e.g. lines for tens and dot/crosses for ones. This could also be represented in a part, part, part, whole picture i.e. $40 + 1 + 8 =$, or by drawing place value counters.



$$41 + 8 =$$

$$41 + 8$$

Children picture use of partitioning and place value in their mind's eye and record in number sentences or in a formal written layout (no bridging of 10).

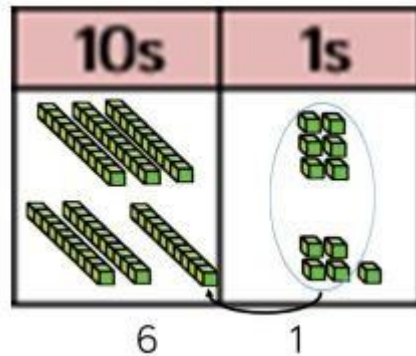
$$1 + 8 = 9$$

$$40 + 9 = 49$$

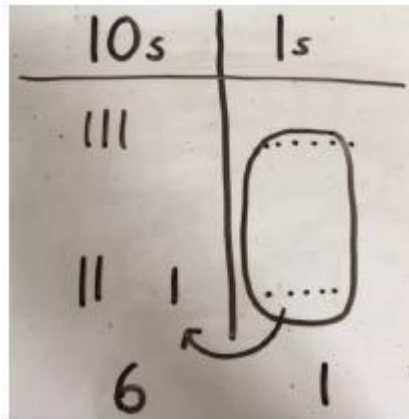
	4	1
+		8
	4	9

TO + TO
Column
method -
regrouping

TO + TO using base 10. Continue to develop understanding of partitioning and place value.
 $36 + 25$



Children to represent the base 10 in a place value chart



Looking for ways to make 10.

$$36 + 25 = \begin{array}{l} 30 + 20 = 50 \\ 5 + 5 = 10 \\ 50 + 10 + 1 = 61 \end{array}$$

Formal method:

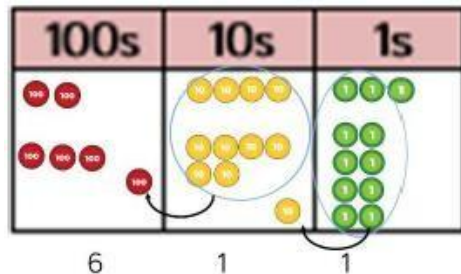
$$\begin{array}{r} +25 \\ 36 \\ \hline 61 \\ 1 \end{array}$$

This can be displayed either with a space for carries under the numbers being added (abacus) or with carries below depending on the needs of the pupils. If they continually forget their carries use abacus layout.

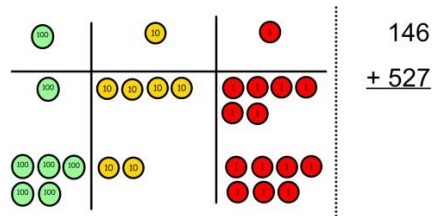
Progression in Calculations

HTO + TO,
HTO + HTO
etc. Column
method-
regrouping

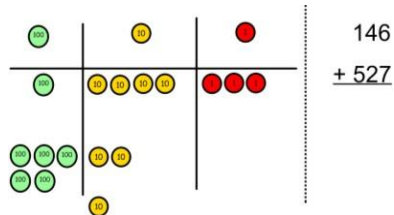
Use of place value counters to add HTO + TO, HTO + HTO etc. When there are 10 ones in the 1s column we exchange them for 1 ten, when there are 10 tens in the 10s column we exchange for 1 hundred.



Make both numbers on a place value grid.

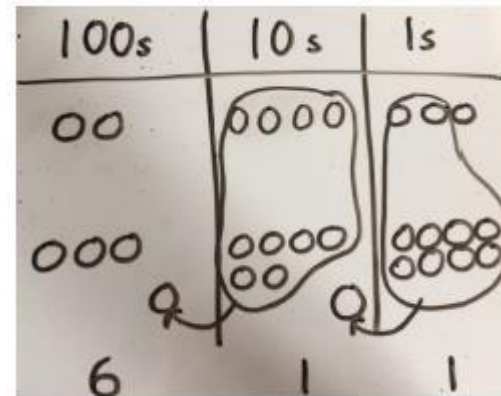


Add up the units and exchange 10 ones for one 10.



Add up the rest of the columns, exchanging the 10 counters from one column for the next

Children can draw a pictorial representation of the columns and place value counters to further support their learning and understanding, circling when they make an exchange.



Children use a formal written method.

$$\begin{array}{r} 243 \\ + 368 \\ \hline 611 \\ 11 \end{array}$$

Carries can be placed in a separate line above the answer line as demonstrated in abacus examples if required. As the children move on, introduce decimals with the same number of decimal places and different. Money can be used here.

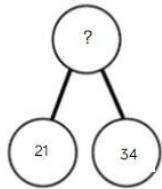
$$\begin{array}{r} 72.8 \\ + 54.6 \\ \hline 127.4 \\ 11 \end{array}$$

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. PV counters may also be used.

	£	2	3	.	5	9
+	£		7	.	5	5
	£	3	1	.	1	4
		1	1		1	

Progression in Calculations

Examples of conceptual variation; different ways to ask children to solve $21 + 34$



?	
21	34

Word problems:

In year 3, there are 21 children and in year 4, there are 34 children. How many children in total?

$21 + 34 = 55$. Prove it

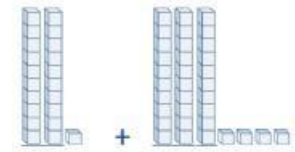
21

+34

$21 + 34 =$

 $= 21 + 34$

Calculate the sum of twenty-one and thirty-four.



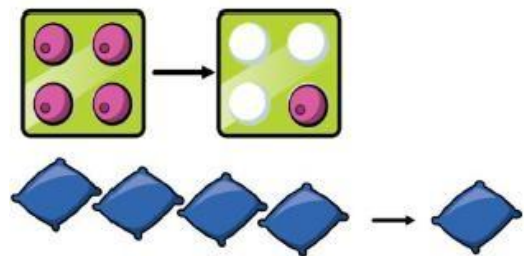
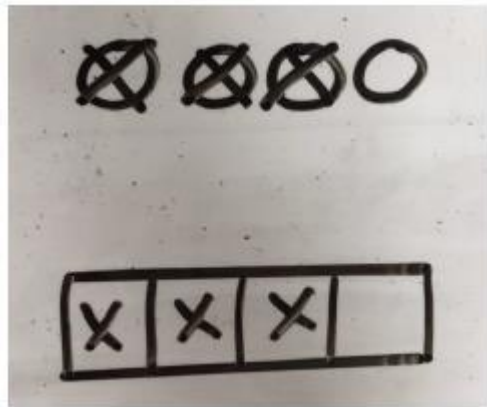
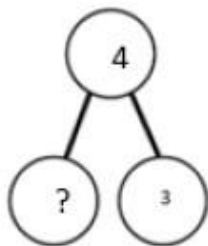
Missing digit problems:

10s	1s
10 10	1
10 10 10	?
?	5

Progression in Calculations

Subtraction

Key Language: take away, less than, the difference, subtract, minus, fewer, decrease.

Objective and Strategies	Concrete	Pictorial	Abstract				
Taking away ones	Physically taking away and removing objects from a whole (ten frames, Numicon, cubes and other items such as beanbags) $4 - 3 = 1$  	Children to draw the concrete resources they are using and cross out the correct amount. The bar model can also be used. 	$4 - 3 =$  $= 4 - 3$ <table border="1" data-bbox="1756 826 2098 912"><tr><td colspan="2">4</td></tr><tr><td>3</td><td>?</td></tr></table> 	4		3	?
4							
3	?						

Counting back

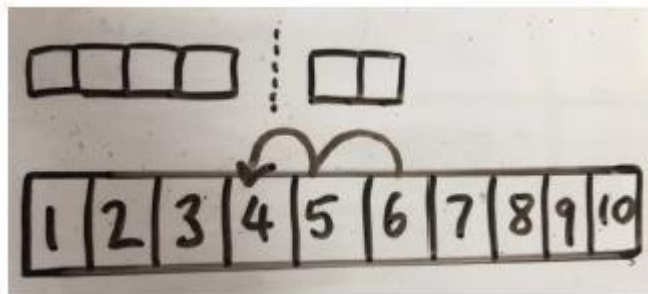
Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones.

$$13 - 4$$

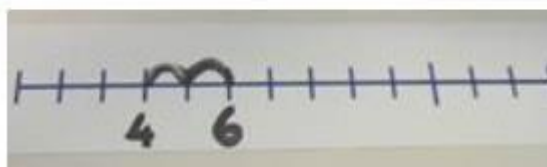
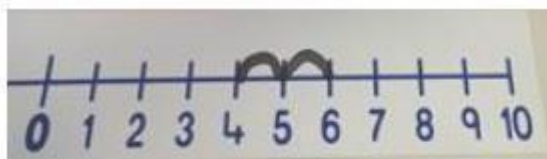
Use counters and move them away from the group as you take them away counting backwards as you go.



Children to represent what they see pictorially e.g.

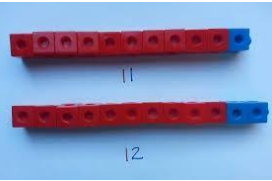
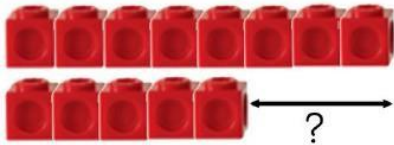
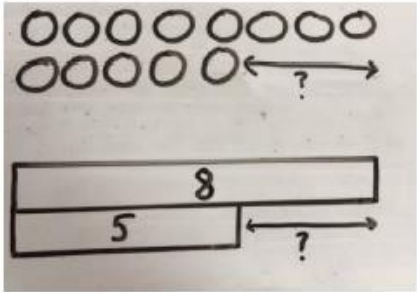


Children to represent the calculation on a number line or number track and show their jumps. Encourage children to use an empty number line.



Children count back mentally and form the number sentence.

Progression in Calculations

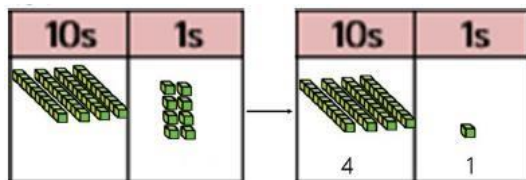
Finding the difference	Compare amounts and objects to find the difference.  Use cubes to build towers or make bars to find the difference 	Children to draw the cubes/other concrete objects which they have used or use the bar model to illustrate what they need to calculate. 	Find the difference between 8 and 5. $8 - 5 =$ The difference is ____ Children to explore why $9 - 6 = 8 - 5 = 7 - 4$ have the same difference.

Progression in Calculations

Part Part Whole Model	Link to addition- use the part whole model to help explain the inverse between addition and subtraction. If 10 is the whole and 6 is one of the parts. What is the other part? $10 - 6 =$	Use a pictorial representation of objects to show the part, part, whole model.	Move to using numbers within the part whole model.
Bridging 10 using known number facts	Bridge 10 using known number facts with cubes on 10 frames. $14 - 5$	Children to present the ten frame pictorially and discuss what they did to bridge 10. $14 - 5 =$ $14 - 4 - 1 =$	Children to show how they can make 10 by partitioning the subtrahend. $14 - 4 = 10$ $10 - 1 = 9$

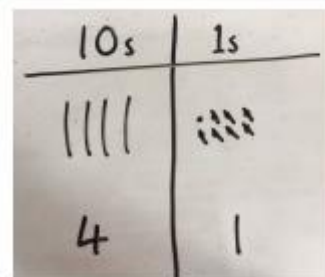
Column
method
without
regrouping /
exchanging

Column method using concrete
resources e.g. base 10
48 - 7



Children to represent the concrete example pictorially.

E.g.



Fluent use of column
method.

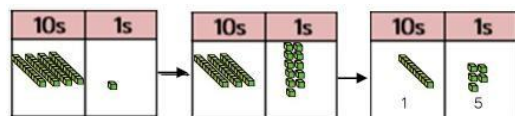
	4	8
-		7
	4	1

Progression in Calculations

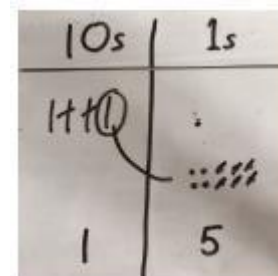
Column
method with
regrouping /
exchanging

Children represent the column method using concrete resources such as base10 and having to exchange.

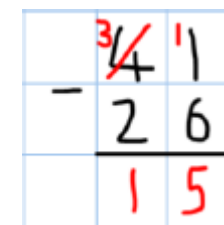
$$41 - 26$$



Children represent the concrete pictorially, remembering to show the exchange.



Formal column method is used. Children must understand that when they have exchanged the 10 they still have 41 because $41 = 30 + 11$

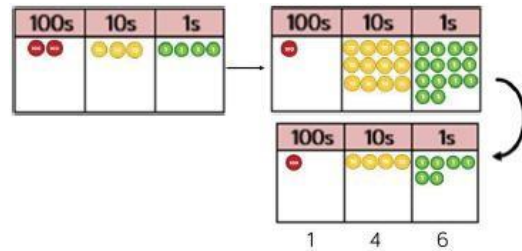


Moving on, children have an understanding of subtracting any number including decimals.

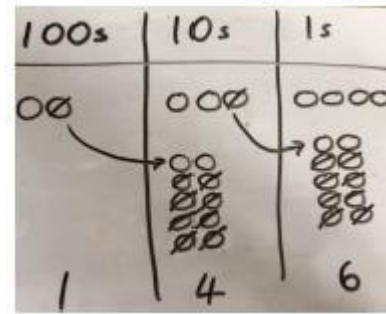
Column
method using
place value
counters.

When dealing with bigger numbers,
children can use place value counters
for representation.

234 - 88



They move on to representing the place value counters
pictorially remembering to show what has been
exchanged.

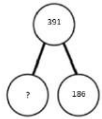


Children must understand
what has happened when
they have crossed out
digits.

$$\begin{array}{r}
 \overset{2}{2}\overset{1}{3}4 \\
 - \quad 88 \\
 \hline
 \quad \quad 6
 \end{array}$$

Progression in Calculations

Examples of conceptual variation; different ways to ask children to solve $391 - 186$



391		
186		?

Raj spent £391, Timmy spent £186.
How much more did Raj spend?

Calculate the difference between 391 and 186.

$$\square = 391 - 186$$

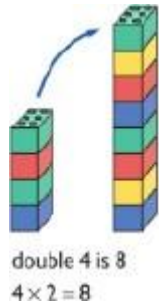
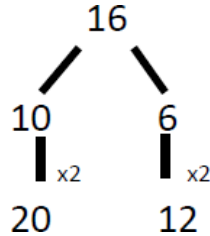
$$\begin{array}{r} 391 \\ -186 \\ \hline \end{array}$$

What is 186 less than 391?

Missing digit calculations

$$\begin{array}{r} 3 \quad 9 \quad \square \\ - \quad \square \quad \square \quad 6 \\ \hline \square \quad 0 \quad 5 \end{array}$$

Progression in Calculations

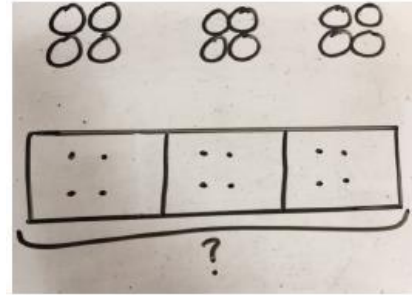
Multiplication			
Key Language: double, times, multiplied by, the product of, groups of, lots of, equal groups.			
Objective and Strategies	Concrete	Pictorial	Abstract
Doubling	Use practical activities to show how to double a number. 	Draw pictures to show how to double a number. Double 4 is 8 	Partition a number and then double each part before recombining it back together. 

Counting in
multiples
Repeated
grouping /
repeated
addition



Count in multiples supported by
concrete objects in equal groups. 4
 $\times 2 = 4$ lots of 2
 $2 + 2 + 2 + 2$
There are 4 equal groups with 2 in
each.

Children represent the practical resources in a picture
and use a bar model.
 $3 \times 4 = 3$ lots of 4 = $4 + 4 + 4$



Count in multiples of a
number aloud.

Write sequences with
multiples of numbers.

2, 4, 6, 8, 10

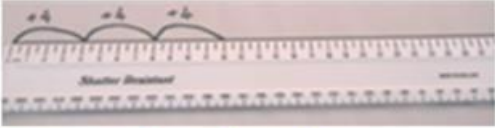
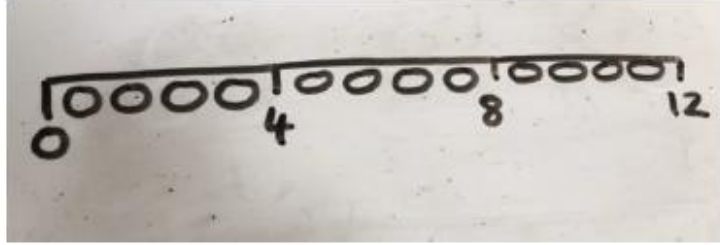
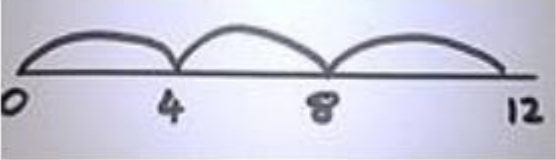
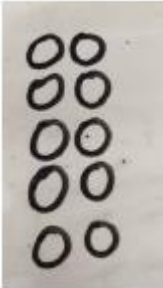
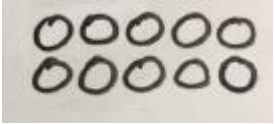
5, 10, 15, 20, 25, 30

Children no longer need
concrete or pictorial to
complete multiplication. 3

$\times 4 = 12$

$4 + 4 + 4 = 12$

Progression in Calculations

Number lines to show repeated groups	Children place concrete resources above numberlines. 3×4   Cuisenaire rods can be used too.	Use of concrete is represented pictorially.  Children move on to using empty number lines. 	Children calculate the multiplication mentally and record the number sentence. $3 \times 4 = 12$
Arrays- showing commutative multiplication	Create arrays using counters/ cubes to show multiplication sentences.  	Draw arrays in different rotations to find commutative multiplication sentences. $5 \times 2 = 10$ $2 \times 5 = 10$  	Use an array to write multiplication sentences and reinforce repeated addition. $5 + 5 + 5 = 15$ $3 + 3 + 3 + 3 + 3 = 15$ $5 \times 3 = 15$ $3 \times 5 = 15$

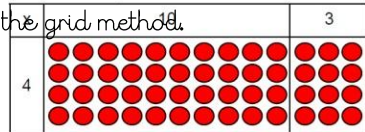
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Progression in Calculations

Grid Method

(to be used to develop number sense before moving to formal written methods)

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



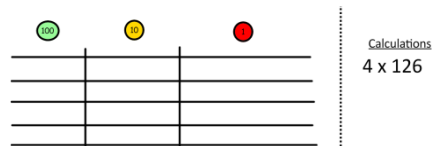
4 rows of 10
4 rows of 3

x	T	U

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

4 rows of 13

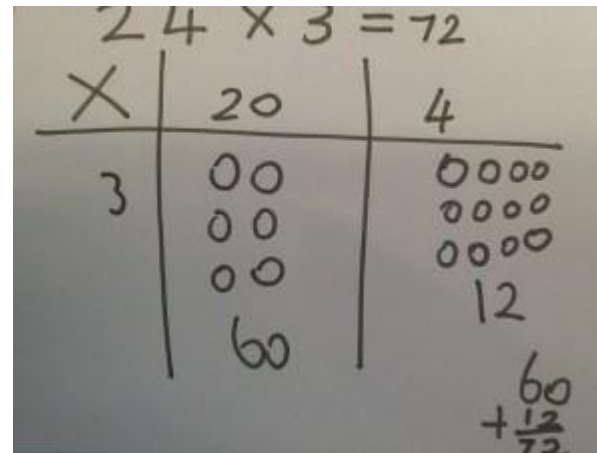
Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows.



Fill each row with 126.

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.

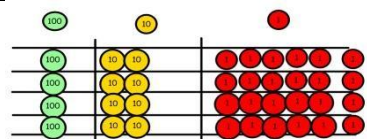
x	30	5
7	210	35

$$210 + 35 = 245$$

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

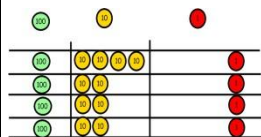
	10	8
10	100	80
3	30	24

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

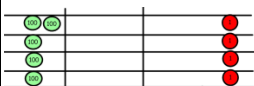


Calculations
4 x 126

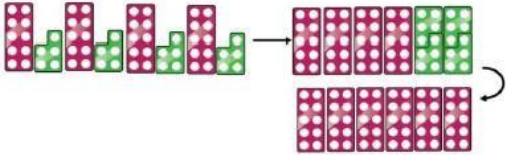
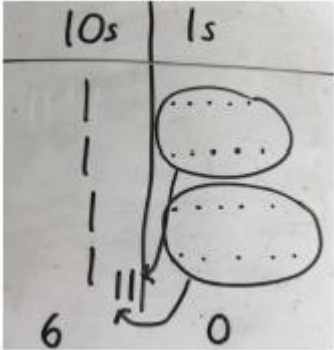
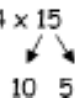
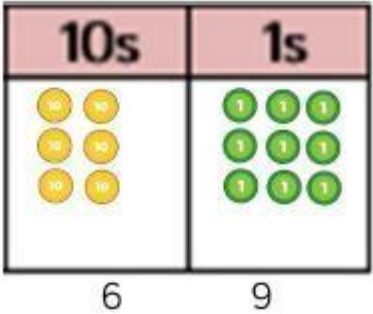
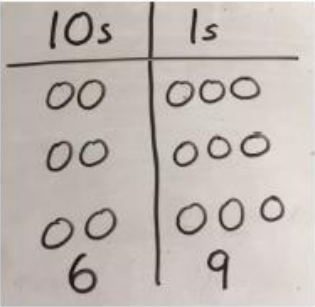
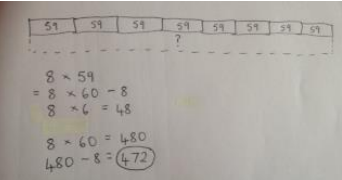
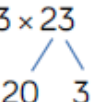
Add up each column, starting with the ones making any exchanges needed.



Then you have
your answer.



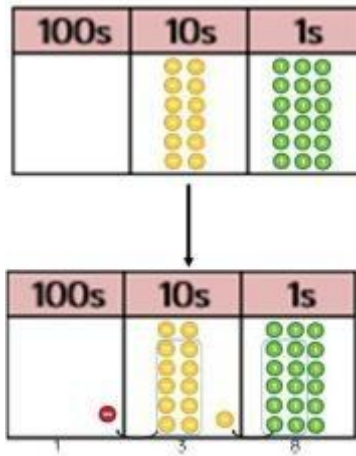
Progression in Calculations

Partition to multiply	Use Numicon, base 10 or Cuisenaire rods. 4×15 	Children to represent the concrete manipulatives pictorially. 	4×15  Children to be encouraged to show the steps they have taken. $4 \times 10 = 40$ $4 \times 5 = 20$ $40 + 20 = 60$
Formal column method without grouping	Children can continue to be supported by place value counters at the stage of multiplication. 	Children to represent the counters pictorially.  Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods. 	Children to record what it is they are doing to show understanding. 3×23  $3 \times 20 = 60$ $3 \times 3 = 9$ $60 + 9 = 69$ $\begin{array}{r} 23 \\ \times 3 \\ \hline 69 \end{array}$

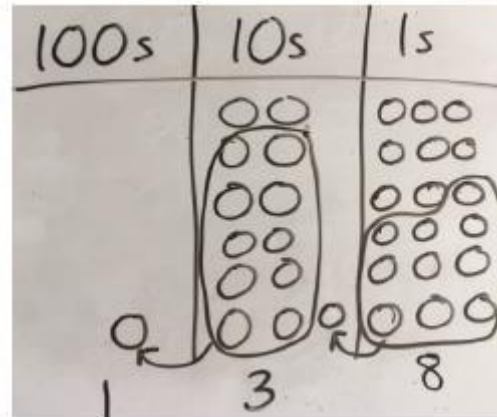
Progression in Calculations

Formal column method with grouping

Formal column method with place value counters.
 6×23



Children to represent the counters/base 10 pictorially e.g. image below.



Formal written method.

$$\begin{array}{r}
 6 \times 23 = \\
 23 \\
 \times 6 \\
 \hline
 138 \\
 \hline
 11
 \end{array}$$

When children start to multiply 3d $\times$ 3d and 4d $\times$ 2d etc., they should be confident with the abstract:

To get 744 children have solved 6×124

To get 2480 they have solved 20×124

For consistency we teach multiplying by ones first then tens, hundreds etc.

$$\begin{array}{r}
 124 \\
 \times 26 \\
 \hline
 744 \\
 2480 \\
 \hline
 3224 \\
 11
 \end{array}$$

Answer: 3224

Progression in Calculations

Examples of conceptual variation; different ways to ask children to solve 6×23

23	23	23	23	23	23
----	----	----	----	----	----

?

Mai had to swim 23 lengths, 6 times a week.
How many lengths did she swim in one week?

With the counters, prove that $6 \times 23 = 138$

Find the product of 6 and 23

$$6 \times 23 =$$

$$\square = 6 \times 23$$

$$\begin{array}{r} 6 \\ \times 23 \\ \hline \end{array} \quad \begin{array}{r} 23 \\ \times 6 \\ \hline \end{array}$$

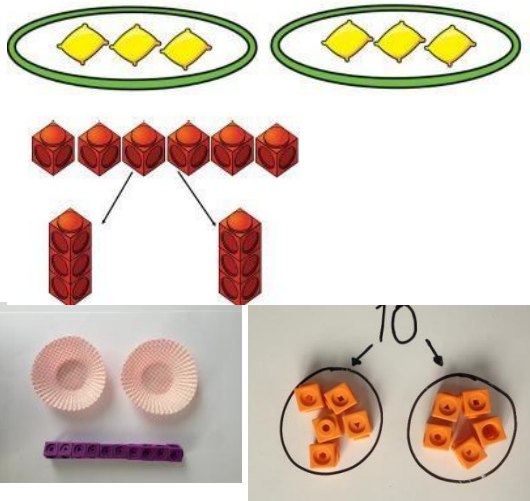
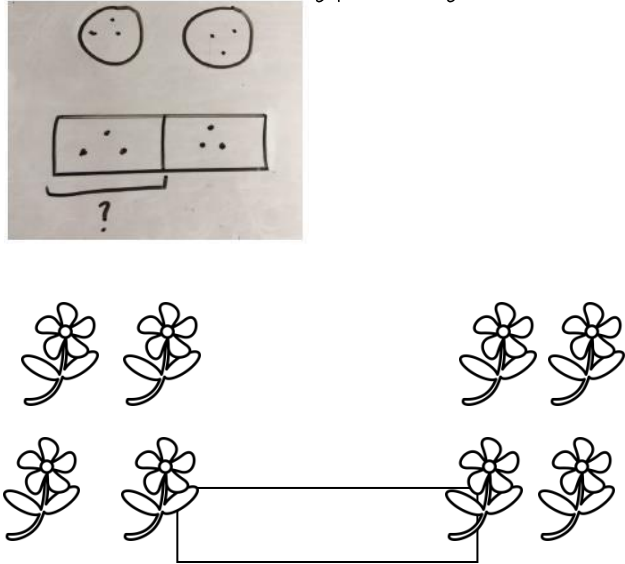
What is the calculation?
What is the product?

100s	10s	1s
		

Progression in Calculations

Division

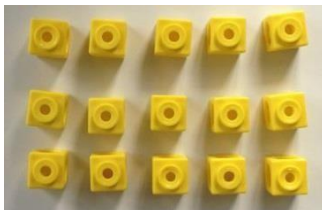
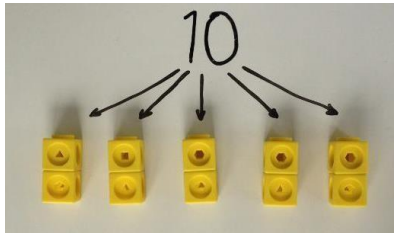
Key Language: share, group, divide, divided by, half.

Objective and Strategies	Concrete	Pictorial	Abstract
Sharing objects into groups	Sharing using a range of objects. $6 \div 2$  I have 10 cubes, can you share them equally in 2 groups?	Children represent sharing pictorially.  $8 \div 2 = 4$	Share 9 buns between three people. $9 \div 3 = 3$ Children should also be encouraged to use their times tables facts.

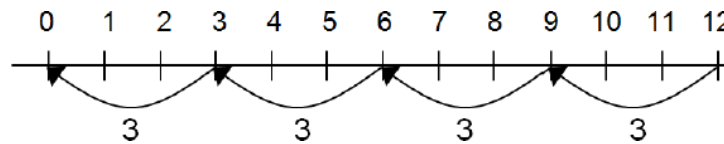
Progression in Calculations

Division as grouping

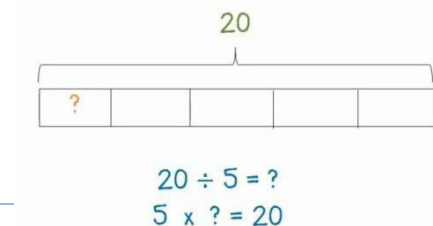
Divide quantities into equal groups.
Use cubes, counters, objects or place value counters to aid understanding.



Use a number line to show jumps in groups. The number of jumps equals the number of groups.



Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.



Children can visualise grouping without concrete or pictorial support and develop knowledge of number fluency to be able to recall facts.

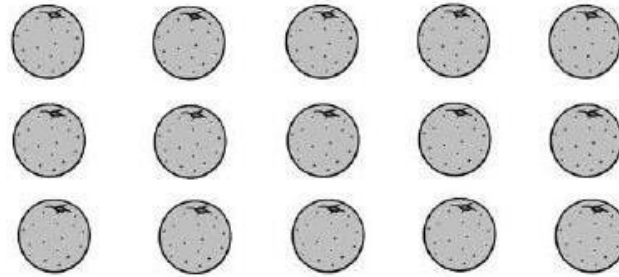
$$28 \div 7 = 4$$

Divide 28 into 7 groups.
How many are in each group?

Division within arrays

Link division
to
multiplication
by creating
an array and
thinking
about the
number sentences that can be created.

Eg $15 \div 3 = 5$ $5 \times 3 = 15$
 $15 \div 5 = 3$ $3 \times 5 = 15$



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.

$$7 \times 4 = 28$$

$$4 \times 7 = 28$$

$$28 \div 7 = 4$$

$$28 \div 4 = 7$$

Progression in Calculations

$2d \div 1d$ with a remainder

Divide objects between groups and see how much ~~is~~ is left over

$$14 \div 3 =$$



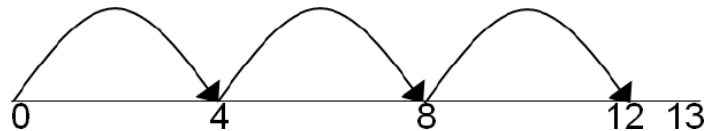
$$13 \div 4 =$$

Use of lollipop sticks to form wholes - squares are made because we are dividing by 4.



There are 3 whole squares, with 1 left over.

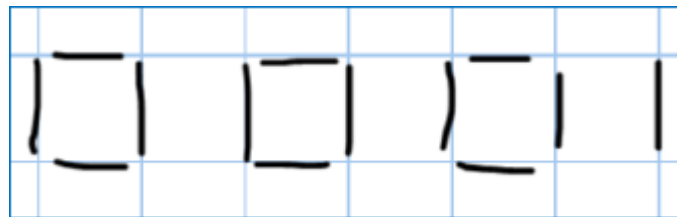
Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.



Draw dots and group them to divide an amount and clearly show a remainder.



Children to represent the lollipop sticks pictorially.



There are 3 whole squares, with 1 left over

Complete written divisions and show the remainder using r.

$$29 \div 8 = 3 \text{ REMAINDER } 5$$

$\uparrow$ $\uparrow$ $\uparrow$ $\uparrow$
 dividend divisor quotient remainder

$$13 \div 4 = 3 \text{ remainder } 1$$

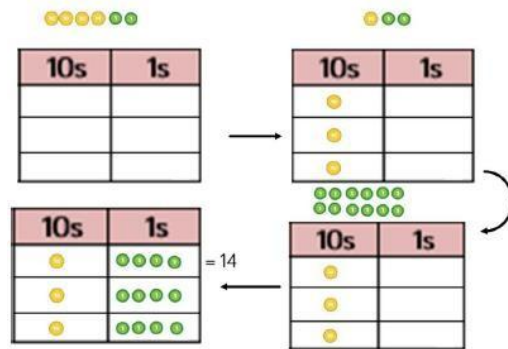
Children should be encouraged to use their times tables facts.

'3 groups of 4, with 1 left over'.

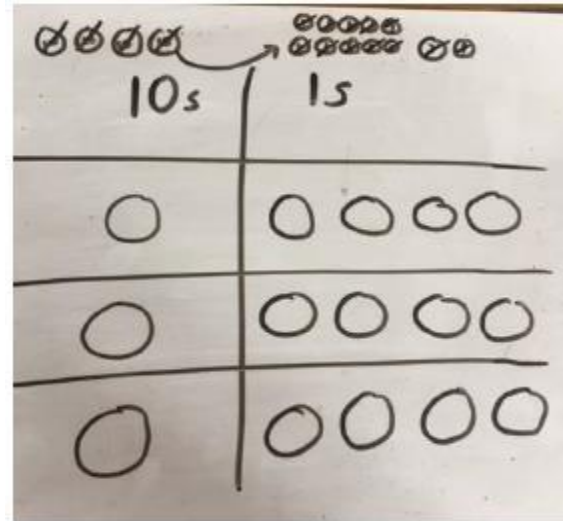
Progression in Calculations

Sharing using
place value
counters.

$$42 \div 3 = 14$$



Children to represent the place value counters pictorially.

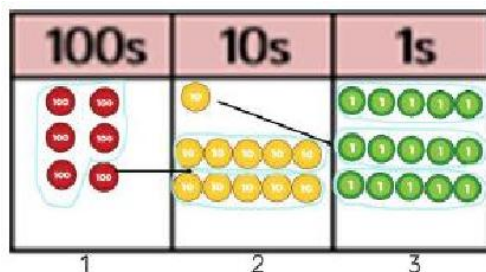


Children to be able to make
sense of the place value
counters and write
calculations to show the
process.

$$\begin{aligned}
 42 \div 3 \\
 42 &= 30 + 12 \\
 30 \div 3 &= 10 \\
 12 \div 3 &= 4 \\
 10 + 4 &= 14
 \end{aligned}$$

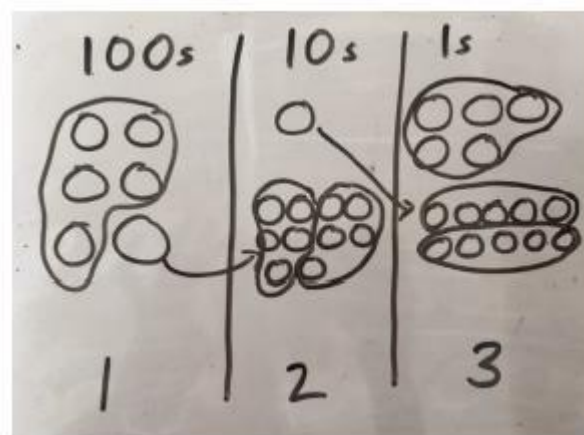
Short division

Children use place value counters to group.



1. Make 615 with place value counters.
2. How many groups of 5 hundreds can you make with 6 hundred counters?
3. Exchange 1 hundred for 10 tens.
4. How many groups of 5 tens can you make with 11 ten counters?
5. Exchange 1 ten for 10 ones.
6. How many groups of 5 ones can you make with 15 ones?

Children represent the place value counters pictorially.



Children to complete the calculation using the short division scaffold. Children can progress to showing remainders.

$$\begin{array}{r} 123 \\ 5 \overline{) 615} \end{array}$$

Children can prove why this works with counters.

Children can be introduced to the chunking method when they are secure with bus stop to allow them exposure to this before learning long division in year 5/6.

Progression in Calculations

Long division

Children should progress from being supported in this method to having no guidance. Children can move on to working out decimal remainders and remainders as fractions.

Chunking Method

The image shows a handwritten calculation for 432 divided by 15 using the chunking method. On the left, a long division setup shows 15 dividing into 432. The first step is subtracting 300 (20 times 15) from 432, leaving a remainder of 132. The next step is subtracting 75 (5 times 15) from 132, leaving a remainder of 57. The final step is subtracting 45 (3 times 15) from 57, leaving a remainder of 12. On the right, a list of multiplication facts for 15 is provided: 1x15=15, 2x15=30, 3x15=45, 4x15=60, 5x15=75, 10x15=150, and 20x15=300. Below the long division, the quotient 28 is written, with a remainder of 12 indicated by 'r12'. At the bottom, the final answer is given as 'Answer: 28 r12'.

$$\begin{array}{r} 15 \overline{) 432} \\ - 300 \quad (20) \\ \hline 132 \\ - 75 \quad (5) \\ \hline 57 \\ - 45 \quad (3) \\ \hline 12 \end{array}$$

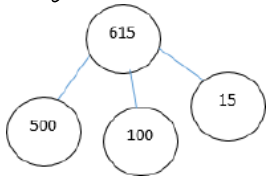
$1 \times 15 = 15$
 $2 \times 15 = 30$
 $3 \times 15 = 45$
 $4 \times 15 = 60$
 $5 \times 15 = 75$
 $10 \times 15 = 150$
 $20 \times 15 = 300$

$\begin{array}{r} 20 \\ 5 \\ 3 \\ \hline 28 \end{array}$ $r12$

Answer: 28 r12

Examples of conceptual variation; different ways to ask children to solve $615 \div 5$

Using the part whole model below, how can you divide 615 by 5 without using short division?



I have £615 and share it equally between 5 bank accounts. How much will be in each account?

615 pupils need to be put into 5 groups. How many will be in each group?

$$5 \overline{)615}$$

$$615 \div 5 =$$

$$\square = 615 \div 5$$

What is the calculation?
What is the answer?

