Mathematics Calculation Policy

St Vincent's Catholic Primary School

Last updated: February 2022

To love, serve and learn as Jesus shows us

Introduction

This policy aims to give guidance linked to the progression in teaching and learning of mental arithmetic and written calculations from Reception to Year 6. It focuses on the four operations of addition, subtraction, multiplication and division. This policy should be used with reference to the St Vincent's Mathematics Handbook.

The overarching aim is, by the end of Key Stage 2, children will be able to use an efficient method for each operation confidently and with understanding. It is encouraged that children recognise how, when and why to use mental methods and written methods to work out a calculation.

This policy sets out the rapid recall and mental calculation facts that our children are expected to master in each year group. Each class focusses on these skills for a dedicated amount of time each day of 10-15 minutes, in addition to the core Maths lesson.

In learning how to calculate using written methods, there are three stages, starting with concrete methods that support conceptual understanding, moving through to pictorial methods and then abstract methods which that allow children to demonstrate efficiency in procedural approaches.

All maths lessons must follow the methods in the policy and be taught in the stages set out, although it is recognised that teachers will adapt approaches in accordance with the needs of their pupils.

The presentation of calculations is vital and all children must be encouraged to set their written methods out neatly, well-spaced and in line with the examples shown in this policy. Where straight lines are required children should always use a ruler. Children should use a ruler to cross out any mistakes and re-write their new answer clearly. Numbers should be formed consistently across the school and additional guidance for this is also set out in the policy.

EYFS

Cardinality and Counting	• Count objects, actions and sounds • Counting: saying number words in sequence • Counting: tagging each object with one number word • Counting: knowing the last number counted gives the total so far • Subitise: recognising small quantities without needing to count them all • Count beyond ten • Link the number symbol with its cardinal number value • Begin to represent number with own symbols • Identifying missing numbers from number lines up to 10 • Conservation: knowing that the number does not change if things are rearranged (as long as none have been added or taken away)
Comparison	• Compare numbers • Understand the one more than / one less than relationship between consecutive numbers • Identify groups with the same number of things • Comparing numbers and reasoning
Composition	• Part–whole: identifying smaller numbers within a number (conceptual subitising – seeing groups and combining to a total) • Inverse operations: partition a number of things into two groups and recognise that those groups can be recombined to make the same total. • A number can be partitioned into different pairs of numbers • A number can be partitioned into more than two numbers • Automatically recall number bonds for numbers 0-5 and some to 10 • Begin to understand mathematical symbols • To begin to represent mathematical sentences with appropriate symbols • To understand and recall doubling facts up to 10 • To be introduced to the concepts of sharing equally and doubling. • Beginning to use the term “half” and understand it means sharing into 2 equal parts • To understand concept of odd and even numbers.

ELG: Number

- Have a deep understanding of number to 10, including the composition of each number
- Subitise (recognise quantities without counting) up to 5
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

ELG: Numerical Patterns

- Verbally count beyond 20, recognising the pattern of the counting system
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

Year 1

Rapid Recall	• All pairs of numbers with a total to 10 e.g. 3+7 • Addition and subtraction facts for all numbers to any number to 10 • Addition doubles of all numbers to at least 10+10 • Halving facts of even numbers to 20 • One and two more/ less than any number up to 100 • 10 more/less of multiples of 10 • 5 more/ less of multiples of 5
Mental Strategies	• Count on or back in ones, twos, fives and tens • Reorder numbers in calculation • Begin to bridge through 10, and later 20, when adding a single-digit number • Use known number facts and place value to add or subtract pairs of single-digit numbers • Add 9 to single-digit numbers by adding 10 then subtracting 1 • Subtract 9 by subtracting 10 then adding 1 • Identify near doubles using doubles already know • Use patterns of similar calculations
Mental Calculations	• Add or subtract a single digit to or from a single digit , without crossing 10 e.g. 4 + 5 , 8 – 3 • Add or subtract a single digit to or from 10 • Add or subtract a single digit to or from a 'teens' number, without crossing 20 or 10 e.g. 13 + 5, 17 – 3 • Double of all numbers to 10 e.g. 8 + 8, double 6

Year 2

Rapid Recall	• Addition and subtraction facts for all numbers to at least 10 • All pairs of numbers with a total of 20 e.g. 13 + 7 • All pairs of multiples of 10 with a total of 100 e.g. 30 + 70 • Multiplication facts for the 2 and 10 times tables and corresponding division facts • Double of all numbers to ten and the corresponding halves • Multiplication facts up to 5 x 5 e.g. 4 x 3 • Know 10x, 2x, 5x tables • Count forwards and backwards in 3's to 36 • Know inverse ÷ for 10, 2 and 5
Mental Strategies	• count on or back in tens or ones • find a small difference by counting up from the smaller to the larger number • reorder numbers in a calculation • add three small numbers by putting the largest number first and/or finding a pair totalling 10 • partition additions into tens and units then recombine • bridge through 10 or 20 • use known number facts and place value to add or subtract pairs of numbers • partition into '5 and a bit' when adding 6, 7, 8 or 9 • add or subtract 9, 19, 11 or 21 by rounding and compensating • identify near doubles • use patterns of similar calculations • use the relationship between addition/subtraction • use knowledge of number facts and place value to multiply or divide by 2, 5 or 10 • use doubles and halves and halving as the inverse of doubling
Mental Calculations	• add or subtract any single-digit to or from any two-digit number, without crossing the tens boundary, e.g. 62 + 4, 38 – 7 • add or subtract any single-digit to or from a multiple of 10, e.g. 60 + 5, 80 – 7 • add or subtract any 'teens' number to any two-digit number, without crossing the tens boundary, e.g. 23 + 14, 48 – 13 • find what must be added to any two-digit multiple of 10 to make 100, e.g. 70 + ? = 100 • add or subtract a multiple of 10 to or from any two-digit number, without crossing 100, e.g. 47 + 30, 82 – 50 • subtract any two-digit number from any two-digit number when the difference is less than 10, e.g. 78 – 71 or 52 – 48 • doubles of all numbers to at least 15, e.g. double 14 • double any multiple of 5 up to 50, e.g. double 35 • halve any multiple of 10 up to 100, e.g. halve 50

Year 3

Rapid Recall	• addition and subtraction facts for each number to 20, e.g. 13 + 4 • sums and differences of multiples of 10, e.g. 70 + 20 or 80 – 30 • number pairs that total 100, e.g. 46 + 54 • multiplication facts for the 2, 3, 4, 5, 6 and 10 times tables and the corresponding division facts
Mental Strategies	• count on or back in tens or ones • find a small difference by counting up from the smaller to the larger number • reorder numbers in a calculation • add three or four small numbers by putting the largest number first and/or by finding pairs totalling 9, 10 or 11 • partition into tens and units then recombine • bridge through a multiple of 10, then adjust • use knowledge of number facts and place value to add or subtract pairs of numbers • partition into '5 and a bit' when adding 6, 7, 8 or 9 • add or subtract mentally a 'near multiple of 10' to or from a two-digit number • identify near doubles • use patterns of similar calculations • say or write a subtraction statement corresponding to a given addition statement • to multiply a number by 10/100, shift its digits one/two places to the left • use knowledge of number facts and place value to multiply or divide by 2, 5 or 10, 100 • use doubling or halving • say or write a division statement corresponding to a given multiplication statement
Mental Calculations	• find what must be added to any multiple of 100 to make 1000, e.g. 300 + ? = 1000 • add or subtract any pair of two-digit numbers, without crossing a tens boundary or 100, e.g. 33 + 45, 87 – 2 • add or subtract any single-digit to any two-digit number, including crossing the tens boundary, e.g. 67 + 5, 82 – 7 • find what must be added to/subtracted from any two-digit number to make the next higher/lower multiple of 10. e.g. 64 + ? = 70, 56 - ? = 50 • subtract any three-digit number from any three-digit number when the difference is less than 10, e.g. 458 – 451, or 603 – 597 • find what must be added to/subtracted from any three-digit number to make the next higher/lower multiple of 10, e.g. 647 + ? = 650, 246 - ? = 240 • double any number to at least 20, e.g. double 18, and corresponding halves, e.g. halve 36; double 60, halve 120; double 35, halve 70; double 450, halve 900 • multiply single-digit numbers by 10 or 100, e.g. 6 x 100 • divide any multiple of 10 by 10, e.g. 60 ÷ 10, and any multiple of 100 by 100, e.g. 700 ÷ 100

Year 4

Rapid Recall	• Multiplication facts of the 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 times tables • Division facts corresponding to tables of 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12
Mental Strategies	• count on or back in repeated steps of 1, 10 and 100 • count up through the next multiple of 10, 100 or 1000 • reorder numbers in a calculation • add 3 or 4 small numbers, finding pairs totalling 10 • add three two-digit multiples of 10 • partition into tens and units, adding the tens first • bridge through 100 • use knowledge of number facts and place value to add or subtract any pair of two-digit numbers • add or subtract 9, 19, 29, 11, 21 or 31 by rounding and compensating • add or subtract the nearest multiple of 10 then adjust • identify near doubles • continue to use the relationship between addition and subtraction • double any two-digit number by doubling tens first • use known number facts and place value to multiply or divide, including multiplying and dividing by 10 and then 100 • partition to carry out multiplication • use doubling or halving • use closely related facts to carry out multiplication and division • use the relationship between multiplication and division
Mental Calculations	• find what must be added to any two-digit number to make 100, e.g. 37 + ? = 100 • add or subtract any pair of two-digit numbers, e.g. 38 + 85, 92 – 47 • find out what must be added to/subtracted from any two- or three-digit number to make the next higher/lower multiple of 100, e.g. 374 + ? = 400, 826 - ? = 800 • subtract any four-digit number from any four-digit number when the difference is small, e.g. 3641 – 3628, 6002 – 5991 • double any whole number from 1 to 50, e.g. double 36, and find all the corresponding halves, e.g. 96 ÷ 2 • double any multiple of 10 to 500, e.g. 380 x 2, and find all the corresponding halves, e.g. 760 ÷ 2, 130 ÷ 2 • double any multiple of 5 to 100, e.g. 65 x 2 • multiply any two-digit number by 10, e.g. 26 x 10 • divide a multiple of 100 by 10, e.g. 600 ÷ 10 • multiply any two-digit multiple of 10 by any single-digit number

Year 5

Rapid Recall	• multiplication facts up to 12 x 12 and corresponding division facts • Derive sums and differences of decimals, e.g. 6.5 ± 2.7 doubles and halves of decimals, e.g. half of 5.6
Mental Strategies	• count up through the next multiple of 10, 100 or 1000 • reorder numbers in a calculation • partition into hundreds, tens and units, adding the most significant digit first • use known number facts and place value to add or subtract pairs of three-digit multiples of 10 and two-digit numbers with one decimal place • add or subtract the nearest multiple of 10 or 100 then adjust • identify near doubles • add several numbers • develop further the relationship between addition and subtraction • use factors • partition to carry out multiplication • use doubling and halving • use closely related facts to carry out multiplication and division • use the relationship between multiplication and division • use knowledge of number facts and place value to multiply or divide
Mental Calculations	• add or subtract any pair of three-digit multiples of 10, e.g. 570 + 250, 620 – 380 • find what must be added to a decimal fraction with units and tenths to make the next higher whole number, e.g. 4.3 + ? = 5 • add or subtract any pair of decimal fractions each with units and tenths, or each with tenths and hundredths, e.g. 5.7 + 2.5, 0.63 – 0.48 • subtract a four-digit number just less than a multiple of 1000 from a four-digit number just more than a multiple of 1000, e.g. 5001-1997 • multiply any two- or three-digit number by 10 or 100, e.g. 79 x 100, 363 x 100 • divide a multiple of 100 by 10 or 100, e.g. 4000 ÷ 10, 3600 ÷ 100 • multiply any two-digit multiple of 10 by a single-digit, e.g. 60 x 7, 90 x 6 • double any whole number from 1 to 100, multiples of 10 to 1000, and find corresponding halves • find 50%, 25%, 10% of small whole numbers or quantities, e.g. 25% or £8

Year 6

Rapid Recall	• multiplication and division facts involving decimals, e.g. 0.8 x 7 and 4.8 ÷ 6 • squares of numbers to 12 x 12 and the corresponding squares of multiples of 10
Mental Strategies	• consolidate all strategies from previous years • use knowledge of number facts and place value to add or subtract pairs of three-digit multiples of 10 and two-digit numbers with one decimal place • add or subtract the nearest multiple of 10, 100 or 1000, then adjust • continue to use the relationship between addition and subtraction • use factors • partition to carry out multiplication • use doubling and halving • use closely related facts to carry out multiplication and division • use the relationship between multiplication and division • use knowledge of number facts and place value to multiply or divide
Mental Calculations	• multiply any two-digit number by a single-digit, e.g. 34 x 6 • multiply any two-digit number by 50 or 25, e.g. 23 x 50, 47 x 25 • multiply or divide any whole number by 10 or 100, giving any remainder as a decimal, e.g. 47 ÷ 10 = 4.7, 1763 ÷ 100 = 17.63 • find squares of multiples of 10 to 100 • find any multiple of 10% of a whole number or quantity, e.g. 70% of £20, 50% of 5kg, 20% of 2 metres

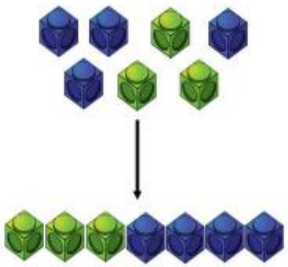
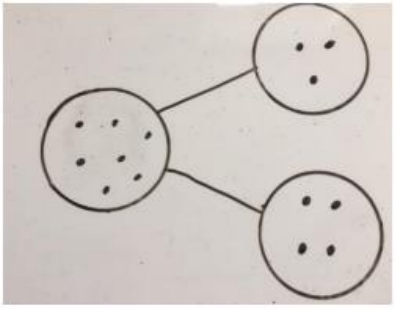
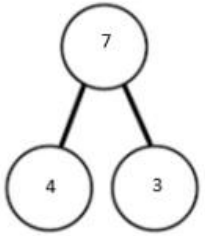
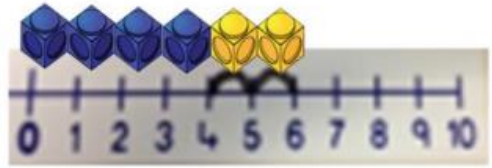
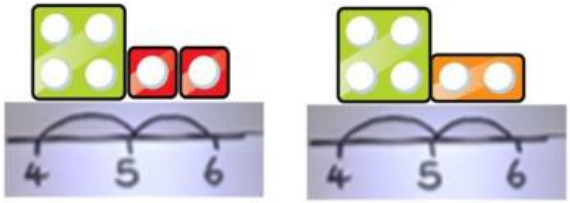
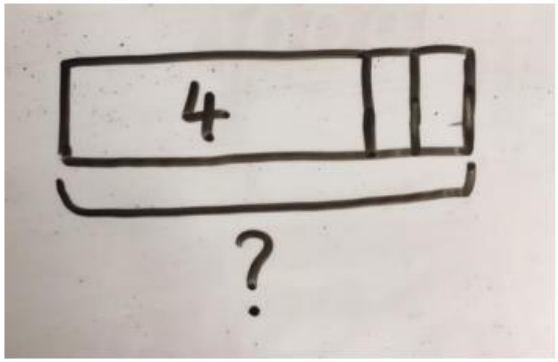
Calculation Guidance: Progression

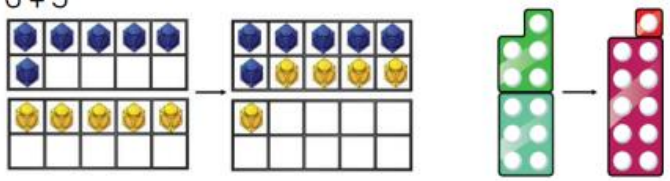
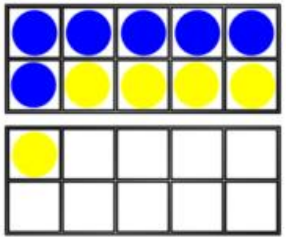
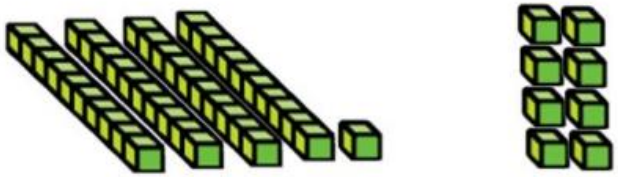
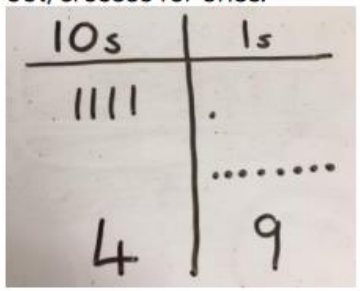
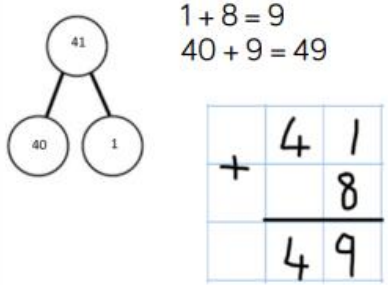
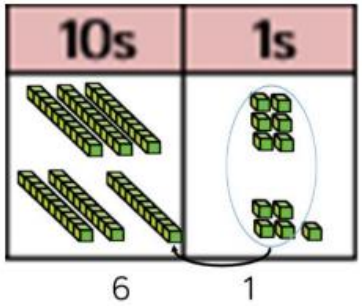
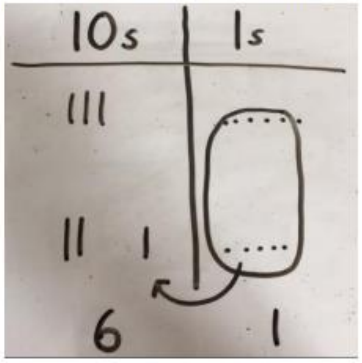
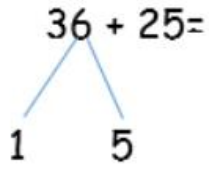
	EYFS/Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition	Combining two parts to make a whole: part whole model. Starting at the bigger number and counting on- using cubes. Regrouping to make 10 using ten frame.	Adding three single digits. Use of base 10 to combine two numbers.	Column method- regrouping. Using place value counters (up to 3 digits).	Column method- regrouping. (up to 4 digits)	Column method- regrouping. Use of place value counters for adding decimals.	Column method- regrouping. Abstract methods. Place value counters to be used for adding decimal numbers.
Subtraction	Taking away ones Counting back Find the difference Part whole model Make 10 using the ten frame	Counting back Find the difference Part whole model Make 10 Use of base 10	Column method with regrouping. (up to 3 digits using place value counters)	Column method with regrouping. (up to 4 digits)	Column method with regrouping. Abstract for whole numbers. Start with place value counters for decimals- with the same amount of decimal places.	Column method with regrouping. Abstract methods. Place value counters for decimals- with different amounts of decimal places.

Multiplication	Recognising and making equal groups. Doubling Counting in multiples Use cubes, Numicon and other objects in the classroom	Arrays- showing commutative multiplication	Arrays 2d × 1d using base 10	Column multiplication- introduced with place value counters. (2 and 3 digit multiplied by 1 digit)	Column multiplication Abstract only but might need a repeat of year 4 first(up to 4 digit numbers multiplied by 1 or 2 digits)	Column multiplication Abstract methods (multi-digit up to 4 digits by a 2 digit number)
Division	Sharing objects into groups Division as grouping e.g. I have 12 sweets and put them in groups of 3, how many groups? Use cubes and draw round 3 cubes at a time.	Division as grouping Division within arrays- linking to multiplication Repeated subtraction	Division with a remainder-using lollipop sticks, times tables facts and repeated subtraction. 2d divided by 1d using base 10 or place value counters	Division with a remainder Short division (up to 3 digits by 1 digit- concrete and pictorial)	Short division (up to 4 digits by a 1 digit number including remainders)	Short division Long division with place value counters (up to 4 digits by a 2 digit number) Children should exchange into the tenths and hundredths column too

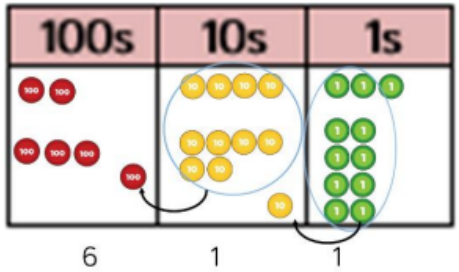
Calculation Guidance: Addition

Key language: sum, total, parts and wholes, plus, add, altogether, more, ‘is equal to’ ‘is the same as’.

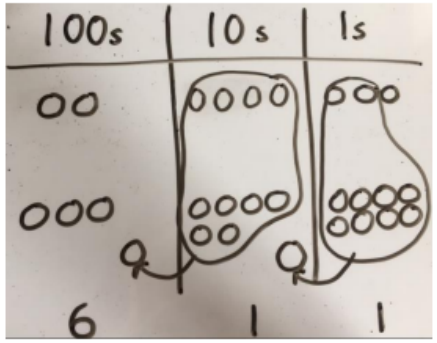
Concrete	Pictorial	Abstract
Combining two parts to make a whole (use other resources too e.g. eggs, shells, teddy bears, cars). 	Children to represent the cubes using dots or crosses. They could put each part on a part whole model too. 	4 + 3 = 7 Four is a part, 3 is a part and the whole is seven. 
Counting on using number lines using cubes or Numicon.  	A bar model which encourages the children to count on, rather than count all. 	The abstract number line: 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; using ten frames and counters/cubes or using Numicon. 6 + 5 	Children to draw the ten frame and counters/cubes. 	Children to develop an understanding of equality e.g. $6 + \square = 11$ $6 + 5 = 5 + \square$ $6 + 5 = \square + 4$
TO + O using base 10. Continue to develop understanding of partitioning and place value. 41 + 8 	Children to represent the base 10 e.g. lines for tens and dot/crosses for ones. 	41 + 8 
TO + TO using base 10. Continue to develop understanding of partitioning and place value. 36 + 25 	Chidlren to represent the base 10 in a place value chart. 	Looking for ways to make 10.  30 + 20 = 50 5 + 5 = 10 50 + 10 + 1 = 61 36 Formal method: +25 61 1

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

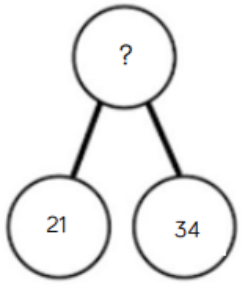


Chidren to represent the counters in a place value chart, circling when they make an exchange.



$$\begin{array}{r} 243 \\ +368 \\ \hline 611 \\ \hline 1\ 1 \end{array}$$

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?

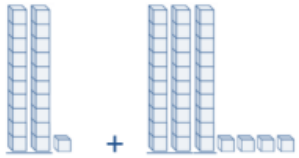
21 + 34 = 55. Prove it

$$\begin{array}{r} 21 \\ +34 \\ \hline \\ \hline \end{array}$$

21 + 34 =

$\square$ = 21 + 34

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

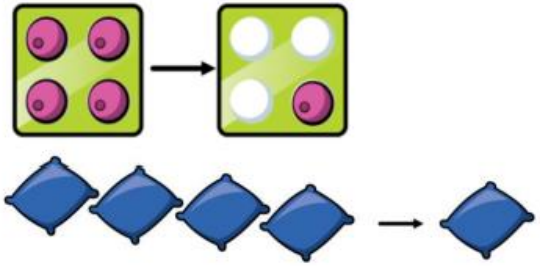
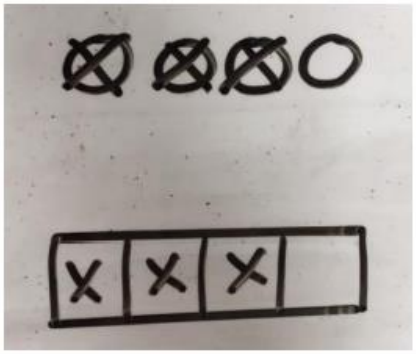
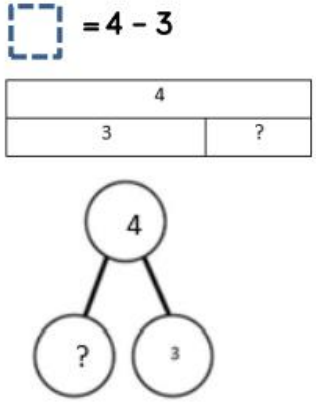
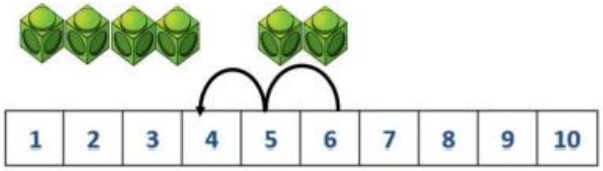
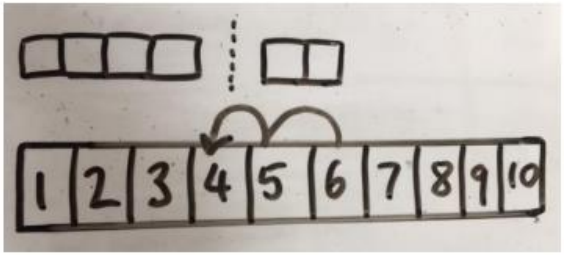
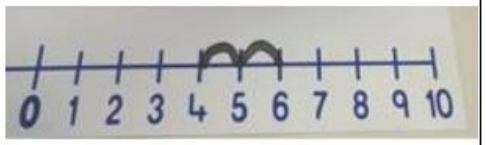
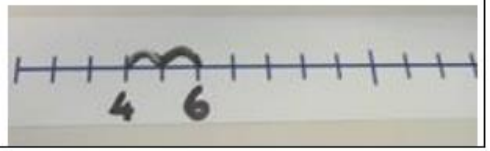


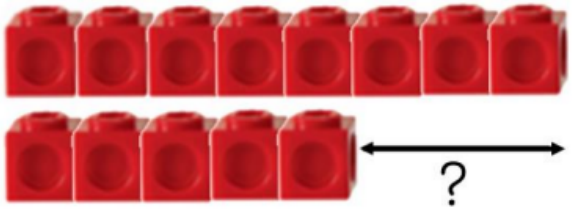
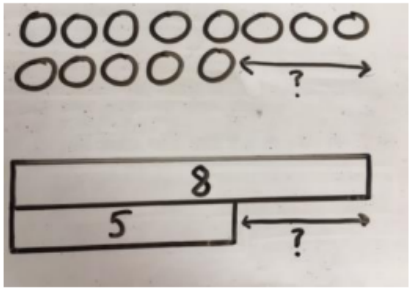
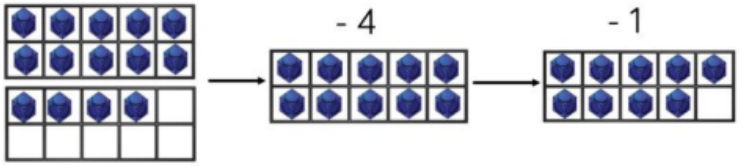
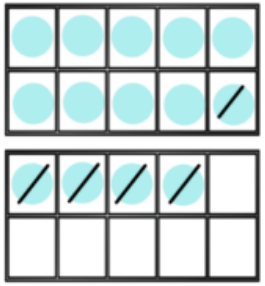
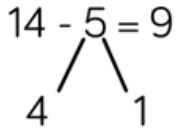
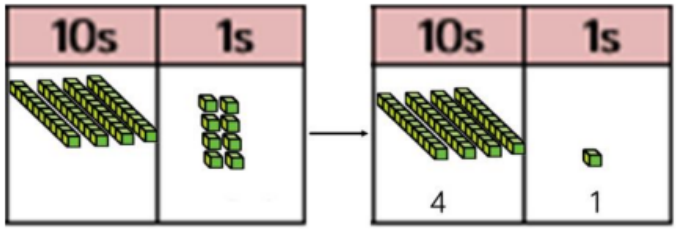
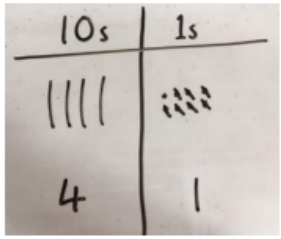
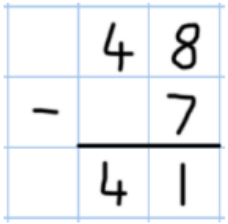
Missing digit problems:

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

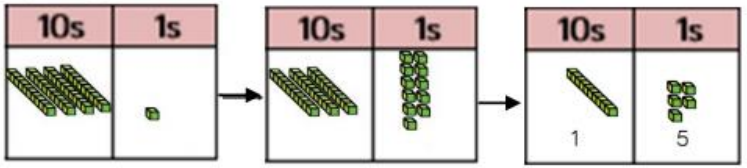
Calculation Guidance: Subtraction

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

Concrete	Pictorial	Abstract
Physically taking away and removing objects from a whole (ten frames, Numicon, cubes and other items such as beanbags could be used). 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 =** 
Counting back (using number lines or number tracks) children start with 6 and count back 2. 6 – 2 = 4 	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  

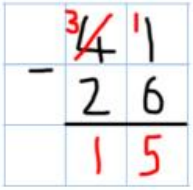
Finding the difference (using cubes, Numicon or Cuisenaire rods, other objects can also be used). Calculate the difference between 8 and 5. 	Children to draw the cubes/other concrete objects which they have used or use the bar model to illustrate what they need to calculate. 	Find the difference between 8 and 5. 8 – 5, the difference is ☐ Children to explore why 9 - 6 = 8 – 5 = 7 – 4 have the same difference.
Making 10 using ten frames. 14 – 5 	Children to present the ten frame pictorially and discuss what they did to make 10. 	Children to show how they can make 10 by partitioning the subtrahend.  14 – 4 = 10 10 – 1 = 9
Column method using base 10. 48-7 	Children to represent the base 10 pictorially. 	Column method or children could count back 7. 

Column method using base 10 and having to exchange.
41 – 26

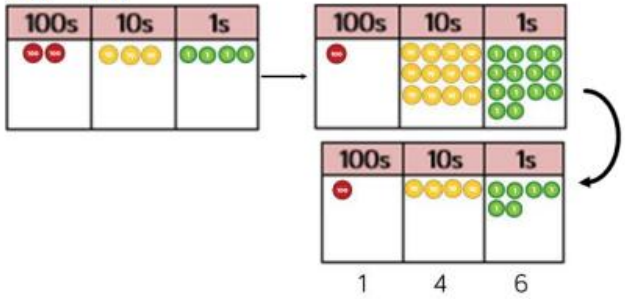


Represent the base 10 pictorially, remembering to show the exchange.

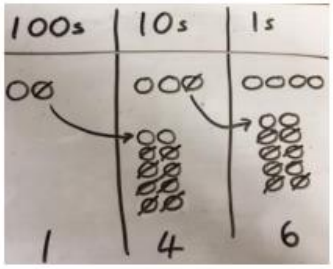
Formal column method. Children must understand that when they have exchanged the 10 they still have 41 because 41 = 30 + 11.



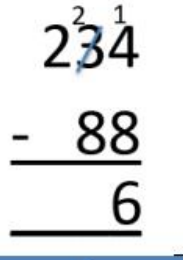
Column method using place value counters.
234 – 88



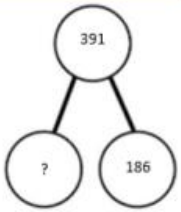
Represent the place value counters pictorially; remembering to show what has been exchanged.



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



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?

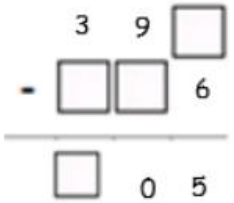
Calculate the difference between 391 and 186.

☐ = 391 – 186

391
-186
___

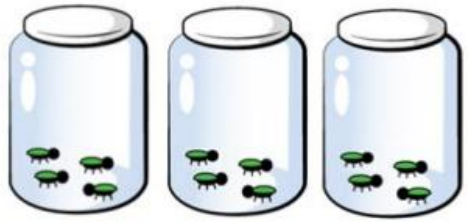
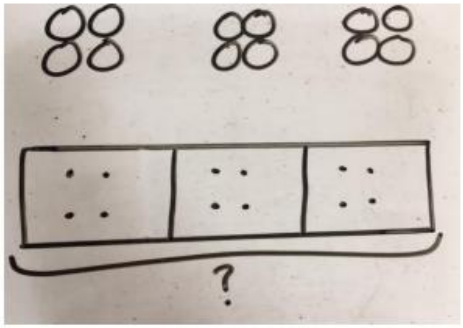
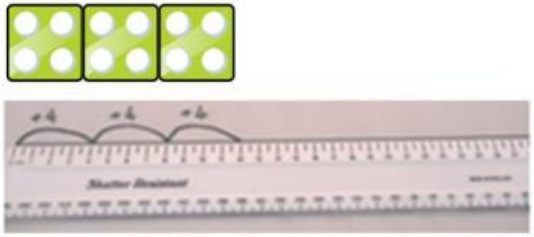
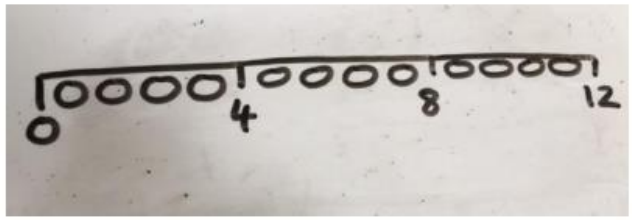
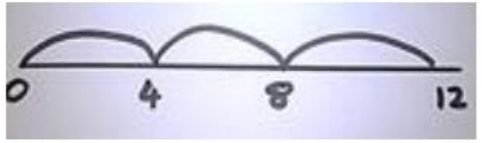
What is 186 less than 391?

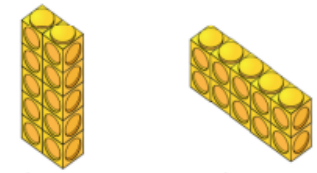
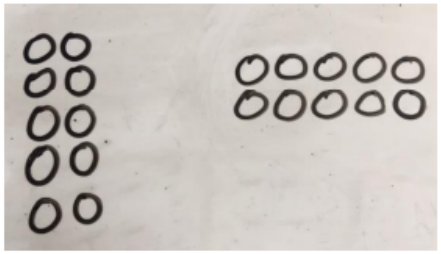
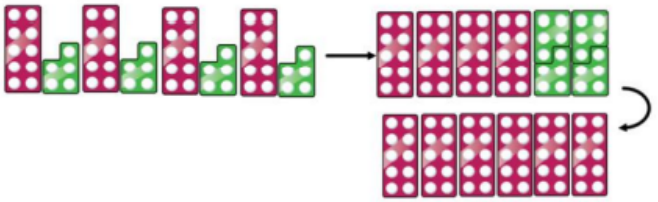
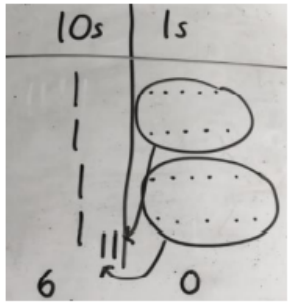
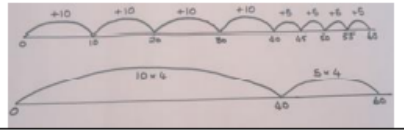
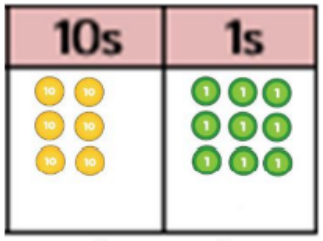
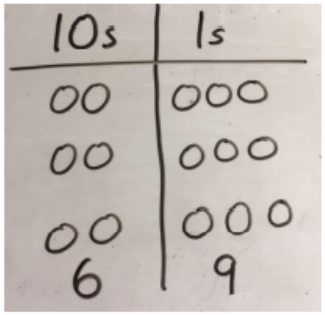
Missing digit calculations



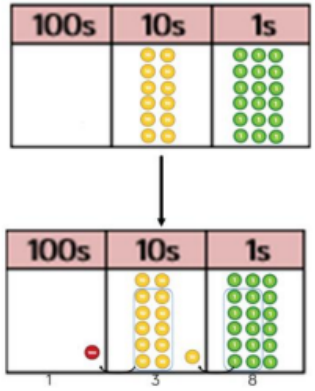
Calculation Guidance: Multiplication

Key language: double, times, multiplied by, the product of, groups of, lots of, equal groups.

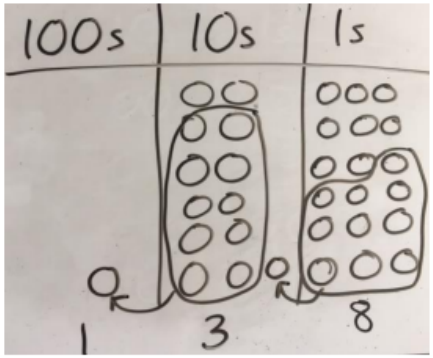
Concrete	Pictorial	Abstract
Repeated grouping/repeated addition 3 × 4 4 + 4 + 4 There are 3 equal groups, with 4 in each group. 	Children to represent the practical resources in a picture and use a bar model. 	3 × 4 = 12 4 + 4 + 4 = 12
Number lines to show repeated groups- 3 × 4  Cuisenaire rods can be used too.	Represent this pictorially alongside a number line e.g.: 	Abstract number line showing three jumps of four. 3 × 4 = 12 

Use arrays to illustrate commutativity counters and other objects can also be used. $2 \times 5 = 5 \times 2$  2 lots of 5 5 lots of 2	Children to represent the arrays pictorially. 	Children to be able to use an array to write a range of calculations e.g. $10 = 2 \times 5$ $5 \times 2 = 10$ $2 + 2 + 2 + 2 + 2 = 10$ $10 = 5 + 5$
Partition to multiply using Numicon, base 10 or Cuisenaire rods. 4×15 	Children to represent the concrete manipulatives pictorially. 	Children to be encouraged to show the steps they have taken. 4×15 $10 \quad 5$ $10 \times 4 = 40$ $5 \times 4 = 20$ $40 + 20 = 60$ A number line can also be used 
Formal column method with place value counters (base 10 can also be used.) 3×23 	Children to represent the counters pictorially. 	Children to record what it is they are doing to show understanding. 3×23 $20 \quad 3$ $3 \times 20 = 60$ $3 \times 3 = 9$ $60 + 9 = 69$ $23 \times 3 = 69$

Formal column method with place value counters.
6 x 23



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



Formal written method

$$6 \times 23 =$$

$$\begin{array}{r} 23 \\ \times\ 6 \\ \hline 138 \\ \hline 1\ 1 \end{array}$$

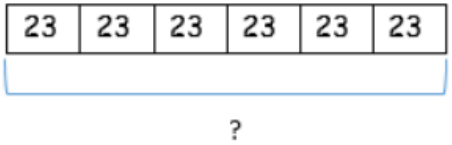
When children start to multiply 3d × 3d and 4d × 2d etc., they should be confident with the abstract:

To get 744 children have solved 6 × 124.
To get 2480 they have solved 20 × 124.

$$\begin{array}{r} 1\ 2\ 4 \\ \times\ \ 2\ 6 \\ \hline 7\ 4\ 4 \\ 2\ 4\ 8\ 0 \\ \hline 3\ 2\ 2\ 4 \\ \hline 1\ 1 \end{array}$$

Answer: 3224

Conceptual variation; different ways to ask children to solve 6 × 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 x 23 = 138

Find the product of 6 and 23

6 × 23 =

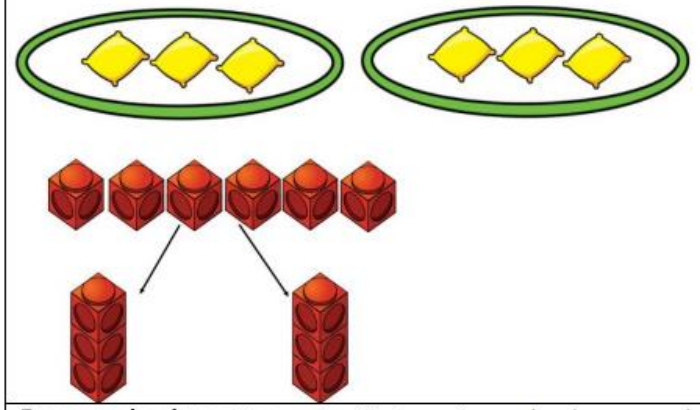
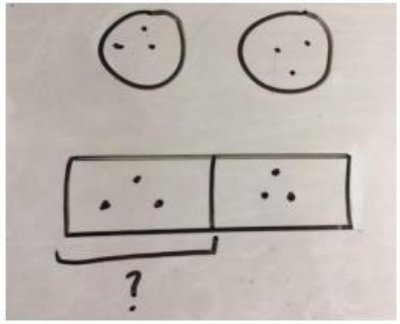
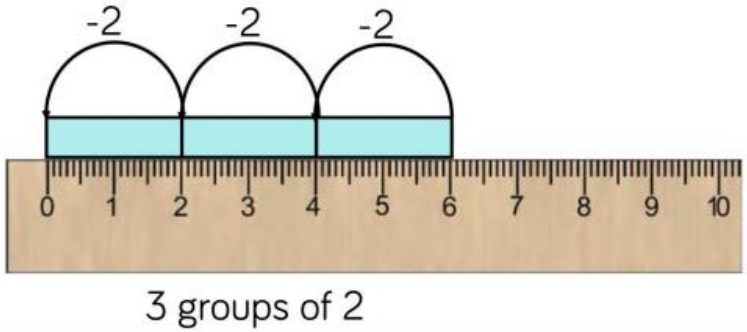
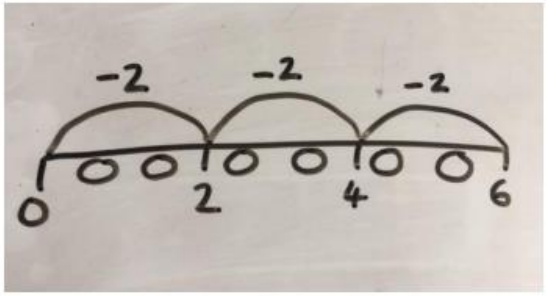
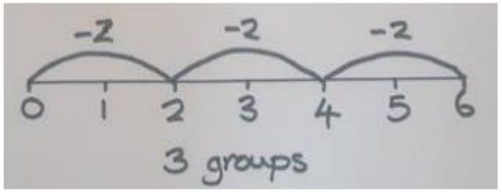
□ = 6 × 23

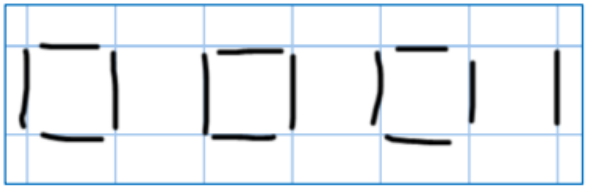
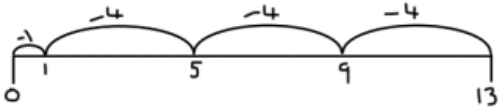
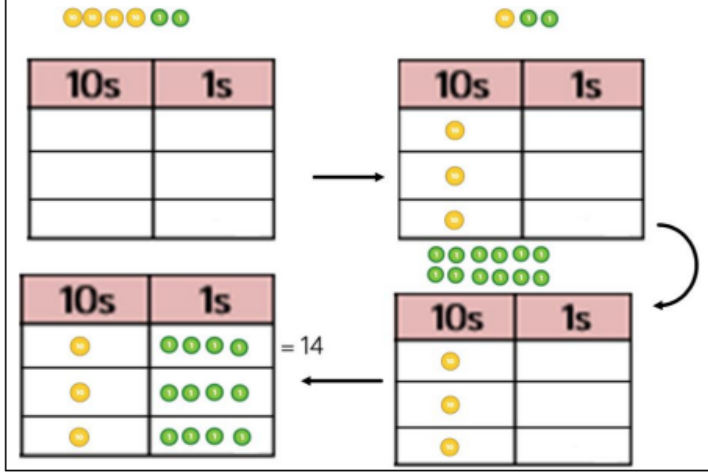
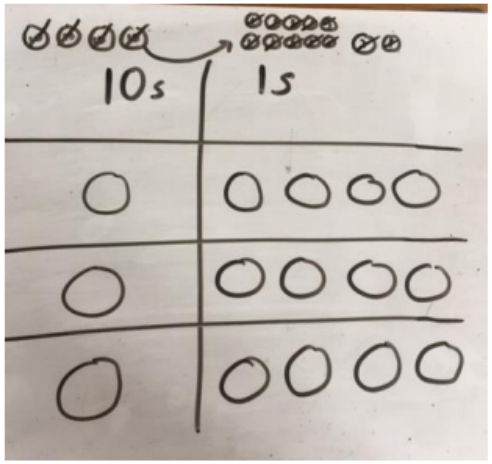
$$\begin{array}{r} 6 \\ \times\ 23 \\ \hline \\ \hline \end{array} \qquad \begin{array}{r} 23 \\ \times\ 6 \\ \hline \\ \hline \end{array}$$

What is the calculation?
What is the product?

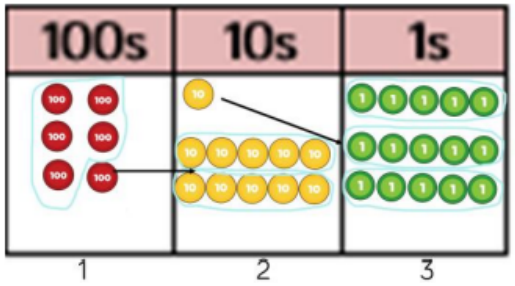
Calculation Guidance: Division

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

Concrete	Pictorial	Abstract
Sharing using a range of objects. 6 ÷ 2 	Represent the sharing pictorially. 	6 ÷ 2 = 3 3 | 3 Children should also be encouraged to use their 2 times tables facts.
Repeated subtraction using Cuisenaire rods above a ruler. 6 ÷ 2  3 groups of 2	Children to represent repeated subtraction pictorially. 	Abstract number line to represent the equal groups that have been subtracted. 

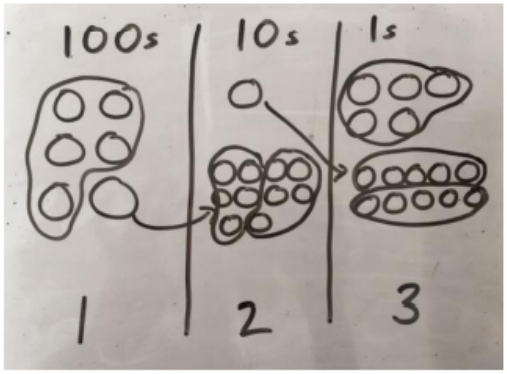
2d ÷ 1d with remainders using lollipop sticks. Cuisenaire rods, above a ruler can also be used. 13 ÷ 4 Use of lollipop sticks to form wholes- squares are made because we are dividing by 4.  There are 3 whole squares, with 1 left over.	Children to represent the lollipop sticks pictorially.  There are 3 whole squares, with 1 left over.	13 ÷ 4 = 3 remainder 1 Children should be encouraged to use their times table facts; they could also represent repeated addition on a number line. '3 groups of 4, with 1 left over' 
Sharing using place value counters. 42 ÷ 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. 42 ÷ 3 42 = 30 + 12 30 ÷ 3 = 10 12 ÷ 3 = 4 10 + 4 = 14

Short division using place value counters to group.
615 ÷ 5



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?

Represent the place value counters pictorially.

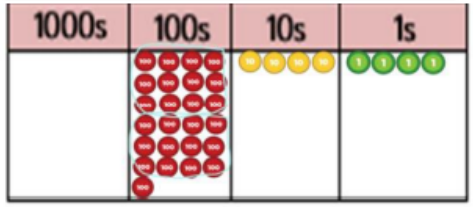


Children to the calculation using the short division scaffold.

$$5\overline{)615}$$

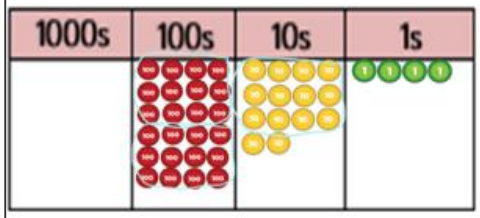
Long division using place value counters
2544 ÷ 12

We can't group 2 thousands into groups of 12 so will exchange them.



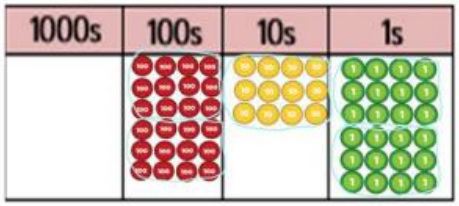
We can group 24 hundreds into groups of 12 which leaves with 1 hundred.

$$\begin{array}{r} 02 \\ 12\overline{)2544} \\ \underline{24} \\ 1 \end{array}$$



After exchanging the hundred, we have 14 tens. We can group 12 tens into a group of 12, which leaves 2 tens.

$$\begin{array}{r} 021 \\ 12\overline{)2544} \\ 24 \\ \hline 14 \\ 12 \\ \hline 2 \end{array}$$

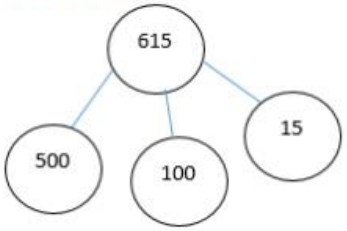


After exchanging the 2 tens, we have 24 ones. We can group 24 ones into 2 group of 12, which leaves no remainder.

$$\begin{array}{r} 0212 \\ 12\overline{)2544} \\ 24 \\ \hline 14 \\ 12 \\ \hline 24 \\ 24 \\ \hline 0 \end{array}$$

Conceptual variation; different ways to ask children to solve 615 ÷ 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 ÷ 5 =

□ = 615 ÷ 5

What is the calculation?
What is the answer?

Number Formation Guidance

Numbers should be formed consistently across the school and children should be made aware of the range of variations that they may see in printed formats.