LANE END CALCULATION POLICY

DIVISION

We follow a Concrete Pictorial Abstract approach to mathematical learning and children work through each stage before moving on to more formal written methods. Models, images and resources are selected carefully to best teach concepts and structures. We recognise that all children work through this approach.

Children should have plenty of opportunity to use objects, diagrams and pictorial representations to solve problems involving both **grouping** *and* **sharing.** They need to know the different between grouping and sharing. Initially teach the 2 concepts separately as detailed below.

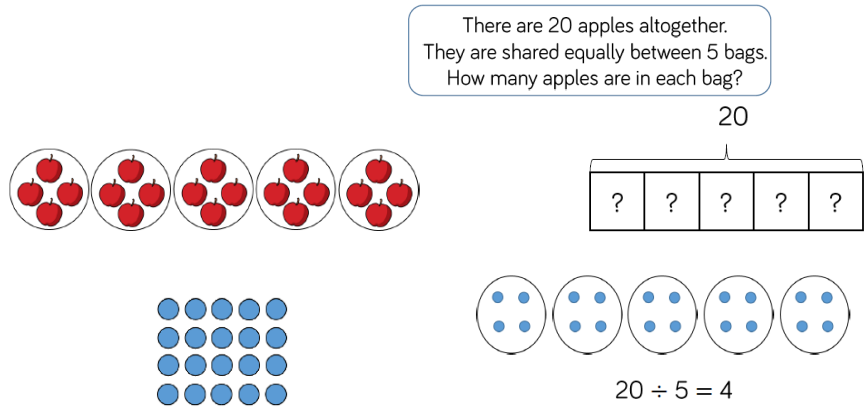
Year 1/2

Skill: Solve 1 step problems involving multiplication (sharing)

Children solve problems by sharing amounts into equal groups.

In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally.

In Year 2, children are introduced to the division symbol.

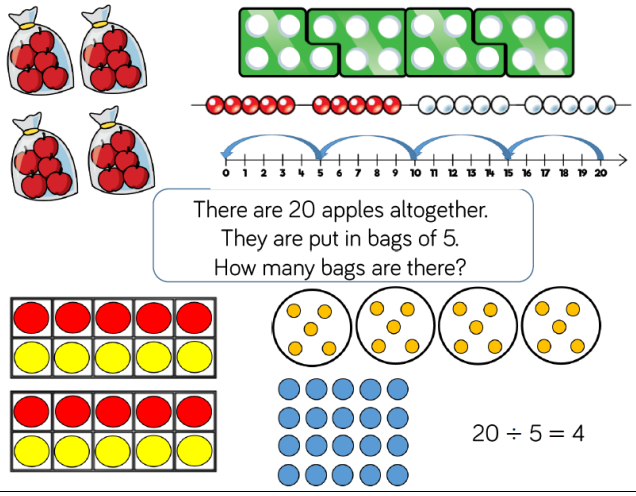


Year 1/2

Skill: Solve 1 step problems involving multiplication (grouping)

Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line.

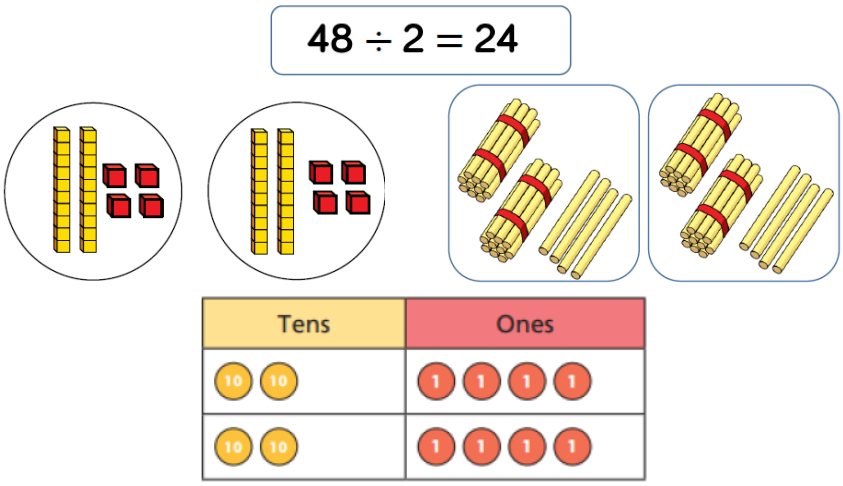
They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.



Year 2

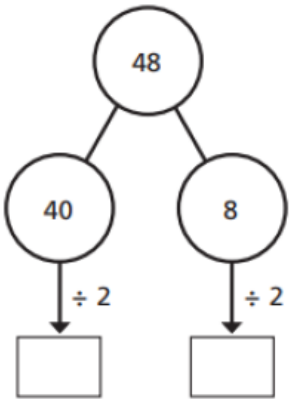
Skill: Divide 2-digits by 1-digit (sharing – no exchange)

When dividing larger numbers, children can use manipulatives that allows them to partition into tens and ones.



Straws, Base 10 and place value counters can all be used to share numbers into equal groups.

Part whole models can provide children with a clear written method that matches the concrete representation. It is important that the children are secure with flexible partitioning of a number before this.

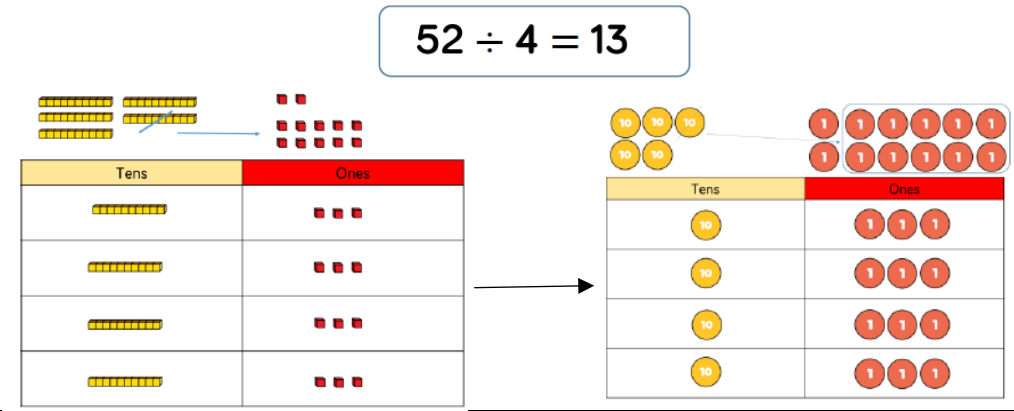


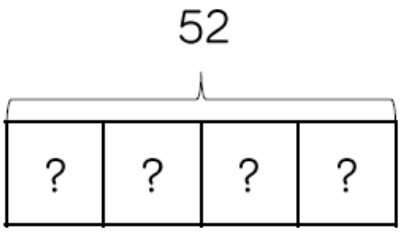
Year 3/4

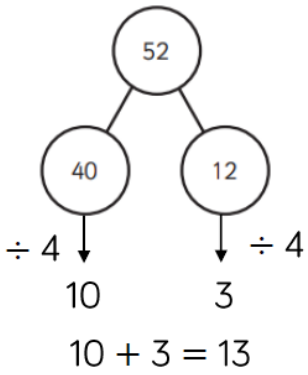
Skill: Divide 2-digits by 1-digit (sharing – with an exchange. Grouping)

When dividing numbers, involving an exchange, children can use Base 10 and place value counters to exchange one ten for ten ones.

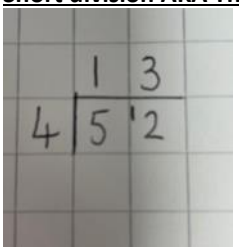
Children should start with the equipment outside the place value grid before sharing the tens and ones equally between the rows.







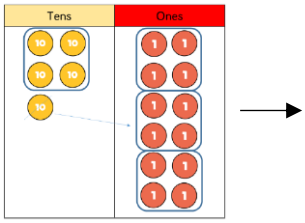
Short division AKA The Bus Stop Method

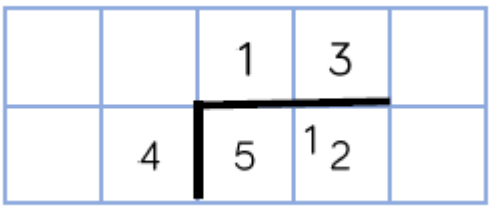


Before moving to short division, children need to have worked through the stages above. When using this method, the children are grouping. Language is important here. Children should consider, 'How many groups of 4 tens can we make?' and 'How many groups of 4 ones can we make?'. Remainders can be seen as they are left ungrouped.

So that children feel secure with this written method, it is best to practice using the 'bus stop method' without an exchange beforehand. Use place value counters, as shown below, alongside calculation in first instance.

e.g.





Year 3/4

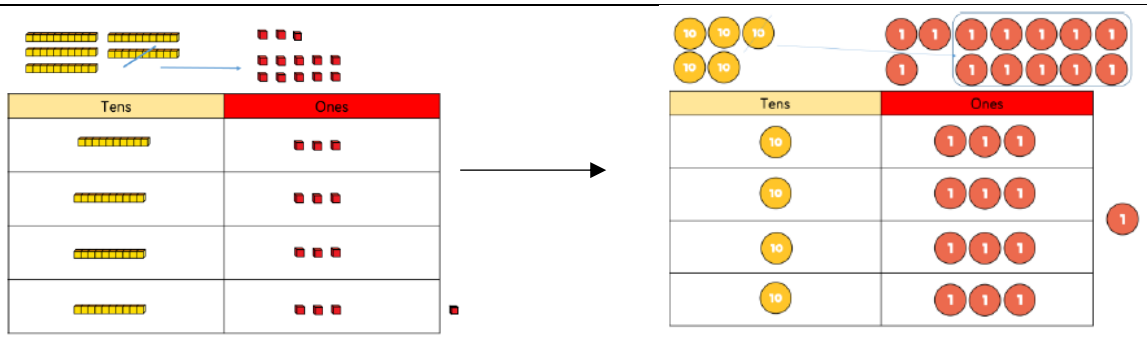
Skill: Divide 2-digits by 1-digit (sharing – with remainders)

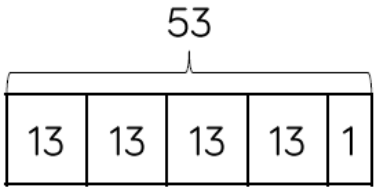
When dividing numbers with remainders, children can use Base 10 and place value counters to exchange one ten for ten ones.

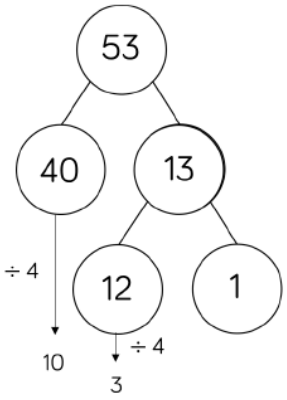
Starting with the equipment outside the place value grid will highlight remainders, as they will be left outside the grid once the equal groups have been made.

Flexible partitioning in a part-whole model supports this method.

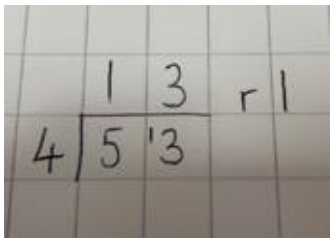
53 ÷ 4 = 13 r1







As mentioned before, the part-whole moel is heavily reliant on flexible partitioning.
The bus stop method for dividing with a remainder is set out as follows:

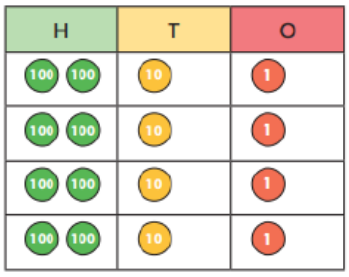


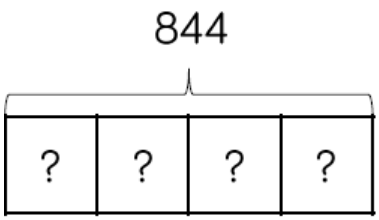
Year 4

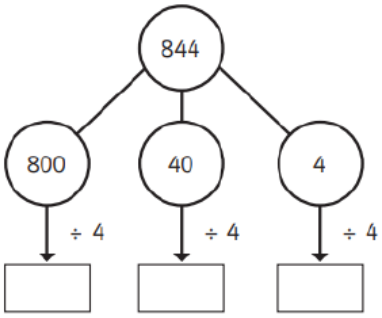
Skill: Divide 3-digits by 1-digit (sharing)

Children can continue to use place value counters to share 3-digit numbers into equal groups.
Children should start with the equipment outside the place value grid before sharing the hundreds, tens and ones equally between the rows.
This method can also help to highlight remainders.
Flexible partitioning supports the part whole method.

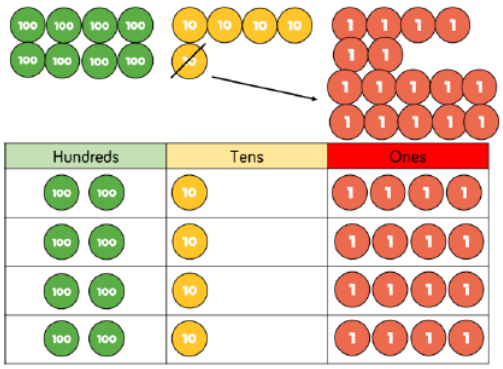
844 ÷ 4 = 211

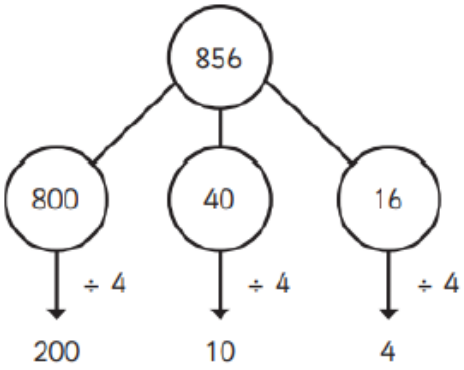






856 ÷ 4 = 214



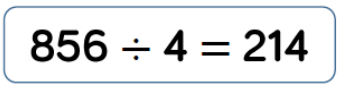


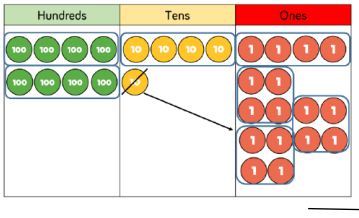
Year 5

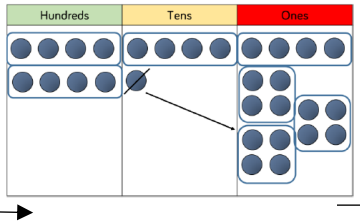
Skill: Divide 3-digits by 1-digit (grouping)

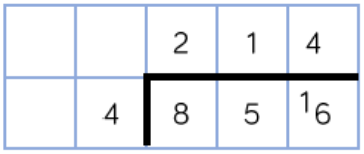
Children can continue to use grouping to support their understanding of short division when dividing a 3-digit number by a 1-digit number.

Place value counters or plain counters can be used on a place value grid to support their understanding. Children can also draw their own counters and group them through a more pictorial method.









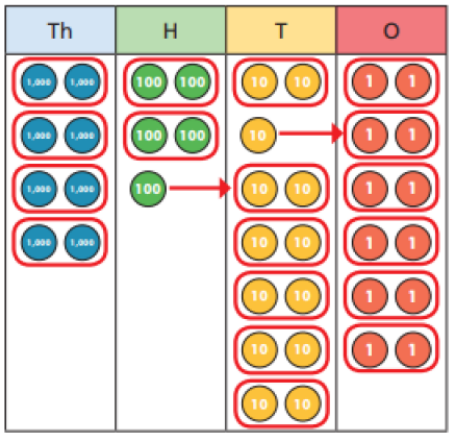
Year 5

Skill: Divide 4-digits by 1-digit (grouping)

Place value counters or plain counters can be used on a place value grid to support children to divide 4-digits by 1-digit. Children can also draw their own counters and group them through a more pictorial method.

Children should be encouraged to move away from the concrete and pictorial when dividing numbers with multiple exchanges.

$$8{,}532 \div 2 = 4{,}266$$



	4	2	6	6
2	8	5	$^{1}3$	$^{1}2$

Year 6

Skill: Divide multi digits by 2 digits (short division)

When children begin to divide up to 4-digits by 2-digits, written methods become the most accurate as concrete and pictorial representations become less effective.

Children can write out multiples to support their calculations with larger remainders.

Children will also solve problems with remainders where the quotient can be rounded as appropriate.

$$432 \div 12 = 36$$

		0	3	6
	12	4	$^{4}3$	$^{7}2$

$$7{,}335 \div 15 = 489$$

	0	4	8	9
15	7	$^{7}3$	$^{13}3$	$^{13}5$

The number line can be provided as a support here:

15	30	45	60	75	90	105	120	135	150

Year 6

Skill: Divide multi digits by 2 digits (long division)

Children can also divide by 2-digit numbers using long division.

Children can write out multiples to support their calculations with larger remainders.

Children will also solve problems with remainders where the quotient can be rounded as appropriate.

432 ÷ 12 = 36

		0	3	6
1	2	4	3	2
	–	3	6	0
			7	2
	–		7	2
				0

(×30)

(×6)

$12 \times 1 = 12$
$12 \times 2 = 24$
$12 \times 3 = 36$
$12 \times 4 = 48$
$12 \times 5 = 60$
$12 \times 6 = 72$
$12 \times 7 = 84$
$12 \times 8 = 96$
$12 \times 7 = 108$
$12 \times 10 = 120$

7,335 ÷ 15 = 489

	0	4	8	9
15	7	3	3	5
–	6	0	0	0
	1	3	3	5
–	1	2	0	0
		1	3	5
–		1	3	5
				0

(×400

(×80)

(×9)

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