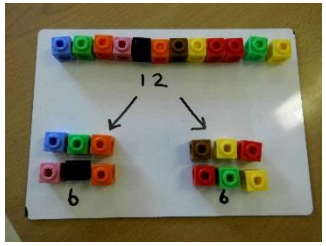
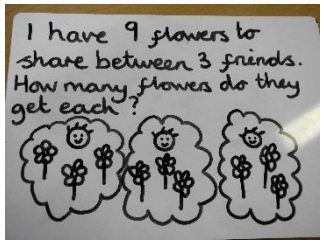
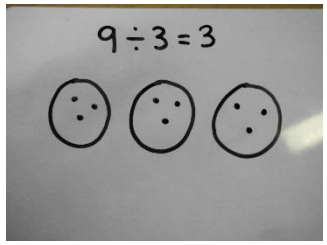
Landulph School - Calculation Policy

Division guidelines

Objectives and strategies	Concrete	Pictorial	Abstract
Stage 1 **Sharing objects into groups** **Recommended for EYFS, Year 1 and Year 2**	Use a range of resources to encourage children to gain practise sharing manipulative *equally* into groups. *I have 12 cubes. Can you share them equally into 2 groups?*  or 	Children use pictures or shapes to draw quantities. Children model grouping them *equally* pictorially to show their understanding.  or 	Children use understanding gathered through concrete and pictorial dividing and times table knowledge to solve simple division sums. 6 ÷ 2 = 3 *I know that 3 + 3 = 6* *I know that 3 x 2 = 6* *I know that ½ of 6 = 3* *I know that double 3 is 6* or *What is the calculation?* **?** **3** | **3** 3 = 6 ÷ 2

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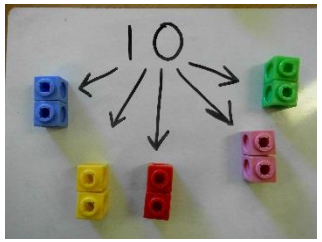
Stage 2

Division as grouping

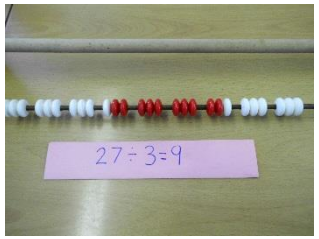
Recommended for Years 2, 3 and 4

Divide quantities into equal groups. Use a wide range of manipulatives to support understanding.



10 ÷ 5 = 2

Or



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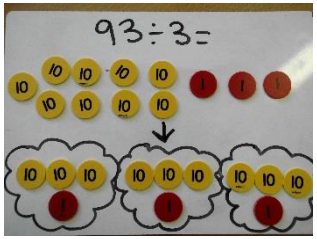
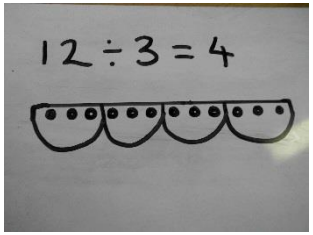
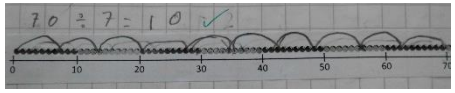


Use a pictorial number line to show jumps in groups. The number of jumps equals the number of groups.

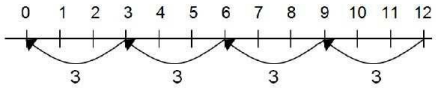


Or

Use a beaded or numerical number line and repeatedly subtract the divisor to show groups.



Or



12 ÷ 3 = 4

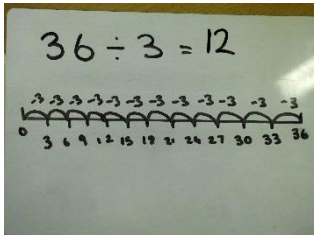
Or

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.

20				
?	?	?	?	?

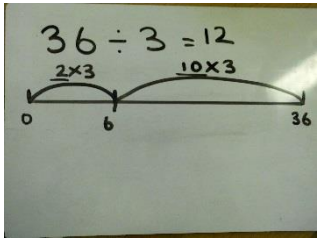
20 ÷ 5 = ?
5 x ? = 20

Children create their own abstract number line to subtract in groups.



Or

Children begin to use their times table understanding to help them subtract multiples using an abstract number line.



Children begin to use their understanding of multiplication to solve division sums using the inverse operation.

36 ÷ 4 = ?

I know that 4 x 9 = 36.

So 36 ÷ 4 must equal 9.

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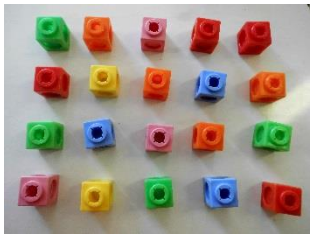
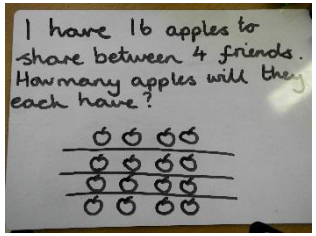
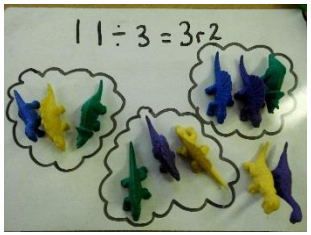
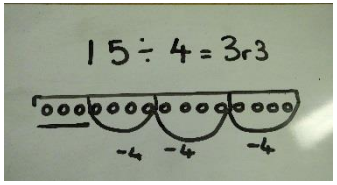
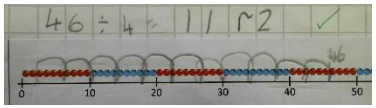
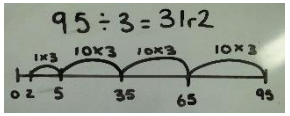
Stage 3 **Division with arrays.** **Recommended for Years 2, 3 and 4**	Link division to multiplication by creating an array and thinking about the number sentences that can be created.  What number sentences can we link to this array? What calculations can you see? 5 x 4 = 20 4 x 5 = 20 20 ÷ 4 = 5 20 ÷ 5 = 4	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
Stage 4 **Division with a remainder** **Recommended for Years 2, 3 and 4**	Divide objects *equally* between groups and see how many items are left over. 	Jump backwards in equal jumps on a pictorial, beaded or numerical number line until you cannot subtract the divisor anymore. Then see how many you have left over as a remainder.  Or 	Children create their own abstract number lines to subtract repeatedly in groups.  Complete written divisions and show the remainder using r. 37 ÷ 5 = 7 r 2 dividend divisor quotient remainder

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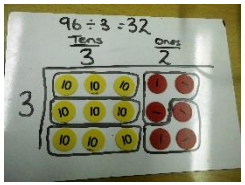
Stage 5

Short division or chunking

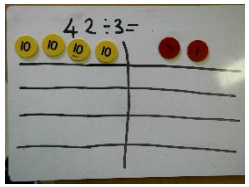
Recommended for Years 4, 5 and 6

Create a physical bus stop method to help children visualise dividing using place value counters.

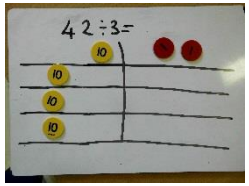


Or

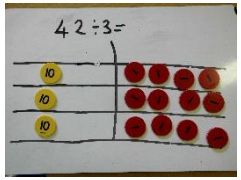
Use place value counters to divide



Start with the biggest place value; share 40 into three groups. Put 1 ten in each group then 1 ten left over.

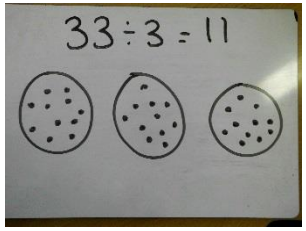


Exchange this ten for ten ones and then share the ones *equally* among the groups.



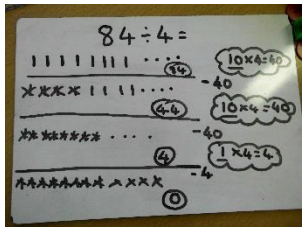
How many is in 1 group? The answer is 14.

Children can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.



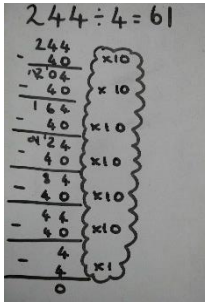
Or

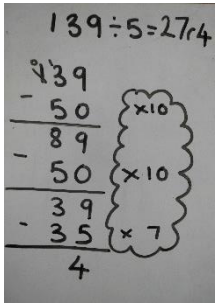
Children to begin using the chunking method by drawing out their HTO using base 10 representations. Children repeatedly subtract multiples of the divisor until they reach 0 or find a remainder.



Children find the answer by counting the multiples of the divisor they have subtracted. The answer is 21.

Children have a go at using repeated subtraction using the chunking method to solve division sums. Children solve sums that divide equally before progressing onto identifying remainders.

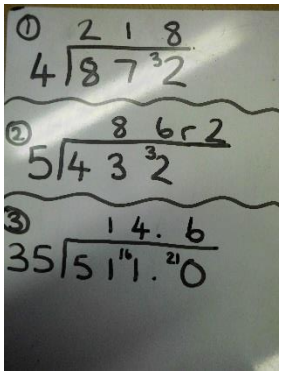




Or

Transition children onto using the bus stop method with:

1. divisions that divide equally with no remainder
2. divisions with a remainder
3. decimal places



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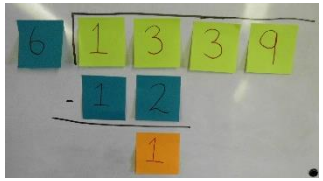
Stage 6

Long division

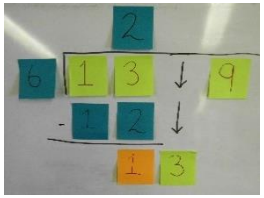
Recommended for Years 5 and 6

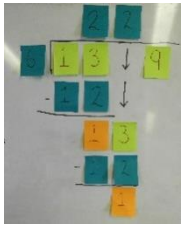
Use post it notes to help children explore how we use the bus stop method to solve larger division sums.

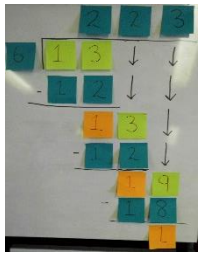
Use different colour post it notes for the dividend, divisor and remainders.

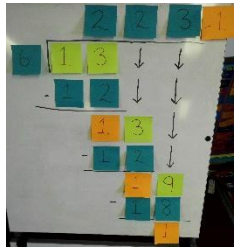


Physically pick up the next number in the dividend and move it down next to the remainder.



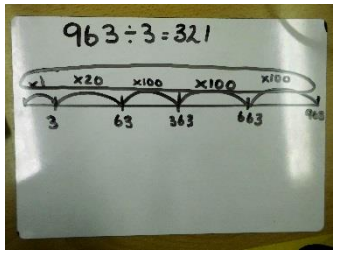




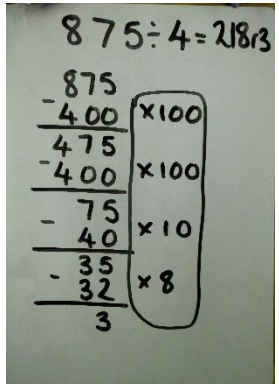


Remember to keep the divisor, dividend and remainders all the same colour. The number at the bottom is the remainder. Children can then progress to converting this into a fraction or decimal.

Children to continue using repeated subtraction on a number line counting back in multiples of the divisor.



When children have mastered this concept, introduce division by chunking. Remember to make links between the two methods.



Divide by single digit before moving onto dividing by 2-digit numbers.

```
      86 r2
5 ⟌ 432
    200     (40 x 5)
    232
    200     (40 x 5)
     32
     30     ((6 x 5 )
      2
```

```
13 ⟌ 1937
   - 1300    13 x 100
     637
   - 520     13 x 40
     117
   - 117     13 x 9
       0
```