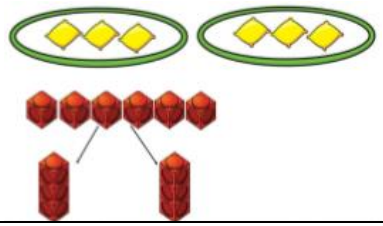
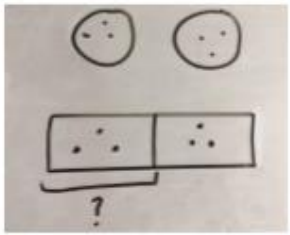
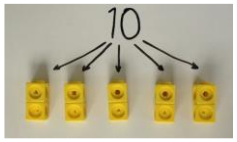
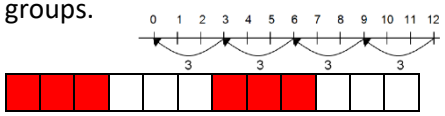
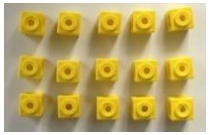
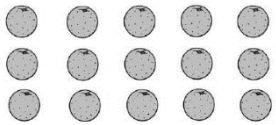
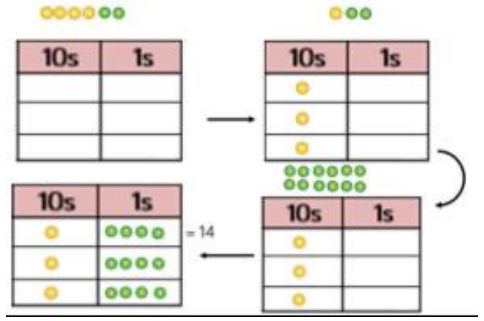
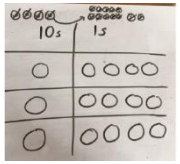
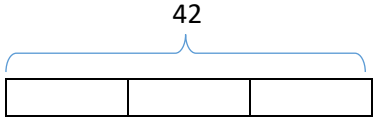
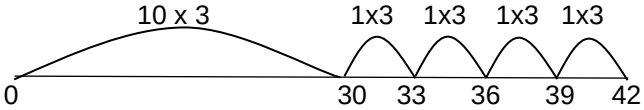
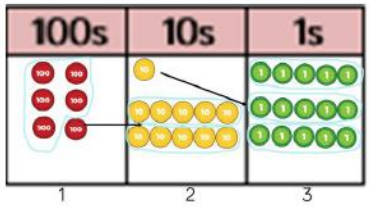
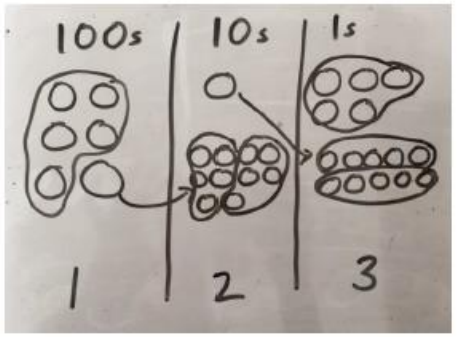
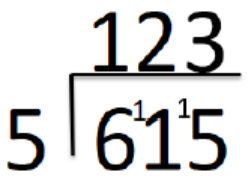
Division

Skills	Concrete	Pictorial	Abstract
Sharing into equal groups each, share, equally, group, groups of, lots of,	6 ÷ 2 		 *End of YR target*
Division as grouping divide, number line, left, left over, subtract, array	Divide quantities into equal groups. Use cubes, counters or objects to aid understanding. 	Use a number line to show jumps in groups. The number of jumps equals the number of groups.  Use of a bar model to build groups of 3.	28 ÷ 7 = 4 Divide 28 into 7 groups. How many are in each group? *End of Y1 target*
Division within arrays array,	Link multiplication to division by creating an array and considering the different number sentences.  15 ÷ 5 = 3 15 ÷ 3 = 5	Draw arrays and use lines as necessary to split into groups. 	Find the inverse of multiplication and division sentences by creating four linking number sentences. 3 x 5 = 15 5 x 3 = 15 15 ÷ 5 = 3 15 ÷ 3 = 5 *End of Y2 target*
Sharing using place value counters place value, counters, exchange, remain, remainder, multiple,	42 ÷ 3 	Convert from physical manipulation of place value counters to drawing in the grid  Refine bar model to show groups. 	Division through chunking 42 ÷3  Progress to efficent 'chunks'.  Progress to remainders and 3-digit numbers. *End of Y3 target*

Division

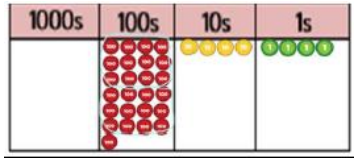
<table>
<tr>
<td>Short division

inverse, divisible by, carry, short division, factor, how many groups of __ in __, remainder as fraction</td>
<td>615 ÷ 5
 

How many groups of 5 hundreds can you make with 6 hundreds?
Exchange 1 hundred into 10 tens. How many groups of 5 tens can you make with 11 tens?
Exchange the 1 ten for 10 ones. How many groups of 5 ones can you make with 15 ones?</td>
<td>Represent the counters pictorally.
 
</td>
<td>Children can now use the short division method and carry remainders numerically to complete the calculation.
 

N.B. See Written Methods page</td>
</tr>
<tr>
<td>Long division

long division, common factor, remainder as decimal, rounded</td>
<td>2544 ÷ 12
 

We can’t sort two thousands into twelve groups, so we exchange them into thousands.
 

2 groups of 12 hundred makes 24 hundred. Once subtracted, 1 hundred remains and forms 14 tens. One group of 12 tens can be made, leaving 2 tens to from 24 ones, which makes 2 groups.</td>
<td colspan="2">212
12 2544
-24
14
-12
24
-24
0

Children apply their learning of short division, and write the groups underneath to use column subtraction to calculate a remainder. The next digit then meets the remainder rather than carrying the remainder over.

N.B. See Written Methods page</td>
</tr>
</table>

Mental Strategies

- Count using times tables
- Make links with halving and quartering; use scaling for larger numbers
- Use arrays
- Use known times tables facts and place value
- Use related facts
- Use relationship between x and ÷
- Partition in different ways to divide
- Use factors pairs to simplify original division sum
- Use distributive law to divide (98 ÷7 = ((70÷7) + (28 ÷ 7)
- Counting in steps of powers of 10

Division

Conceptual variation (to build fluency):

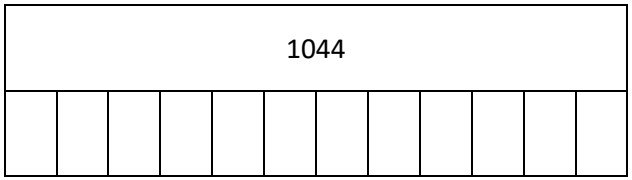
1044 ÷ 12

? = 1044 ÷ 12

Biscuits are packed into boxes of 12. How many boxes are needed to pack 1044 biscuits?

12 | 1044

Prove that 1044 candles can be shared equally amongst 12 boxes.

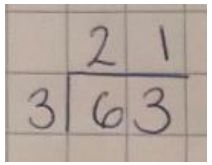


Written Methods of Division

N.B. Written abstract methods must only be used once children have a secure understanding of the operation and place value.

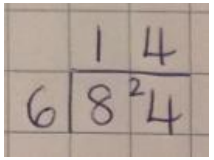
1. Short division (no carrying)

63 ÷ 3

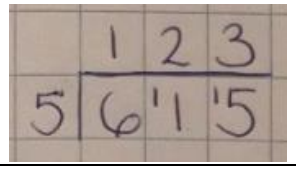


2. Short division (carrying remainders)

84 ÷ 6

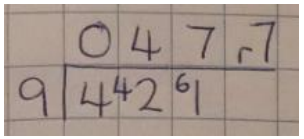


615÷ 5



3. Short division with remainders

421 ÷ 9



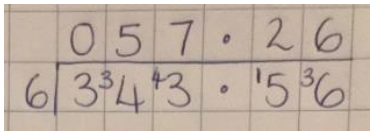
Teaching Point

Ensure that children are taught how to represent remainders as integers and as fractions.

End of Y4 target

4. Short division with decimal points

343.56 ÷ 6



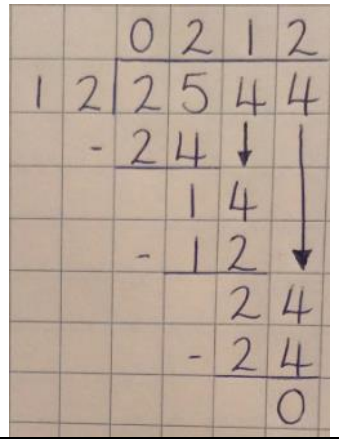
Teaching Point

Once children are secure in remembering the decimal point, it can sit on the line in between boxes.

End of Y5 target

5. Long division

2544 ÷ 12



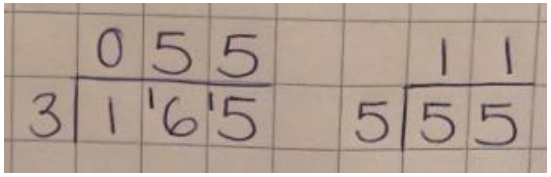
Teaching Point

Children apply their learning of short division, and write the groups underneath to use column subtraction to calculate a remainder. The next digit then meets the remainder rather than carrying the remainder over.

For decimal long division, add the decimal point before solving the calculation.

5a. Alternative method: factor pairs (Double bus stop)

165 ÷ 15



Teaching point

Children record a factor pair of the 2-digit divisor and complete 2 short division sums in place of long division.

This option must only be used for children who cannot fluently apply long division. **N.B.** This does not work if the divisor is prime.

End of Y6 target