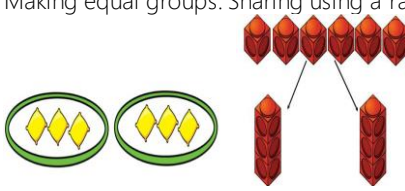
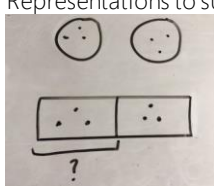
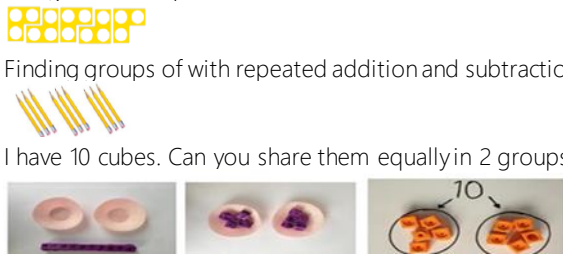

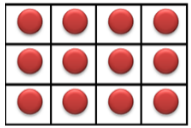



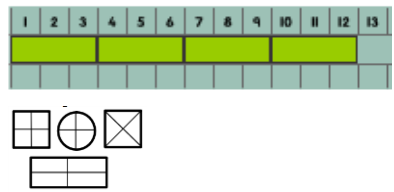


Division at Milverton

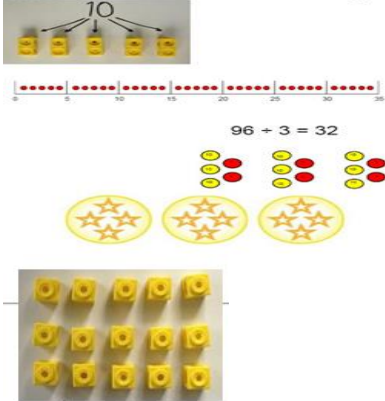


Year	Concrete	Pictorial	Abstract		
EYFS	<p>Halving ($\div 2$)</p> <p>Making equal groups. Sharing using a range of objects.</p> 	<p>Representations to support</p> 	<p>$6 \div 2 = 3$</p> <table border="1" data-bbox="1489 406 1848 486"> <tr> <td>3</td> <td>3</td> </tr> </table> <p>Children should be encouraged to use their 2 times table facts.</p>	3	3
	3	3			
Year 1	<p>Single digit division Grouping ($\times 2 \times 5 \times 10$)</p>				
	<p>Making equal groups Repeated subtraction: Using familiar objects and resources.</p>  <p>Finding groups of with repeated addition and subtraction.</p> <p>I have 10 cubes. Can you share them equally in 2 groups?</p> <p>Arrays</p> 	<p>Understand visual representations of Arrays</p>  <p>Children use pictures or shapes to share quantities.</p>  <p>$8 \div 2 = 4$</p>	<p>Using multiplication facts Share 15 buns between three people.</p> <p>$15 \div 3 = 5$</p>		
<p>Finding half and quarter (equal part of a quantity)</p>					
<p>See EYFS for half - Use familiar objects and resources</p>  <p>In quarters</p> 	<p>Draw a variety of models and images</p> 	<p>Recognise unit fraction notation: $\frac{1}{2}$ and $\frac{1}{4}$</p>			



Single digit division Grouping (x2 x5 x10 x3)

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



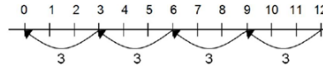
Link division to multiplication by creating an array and thinking about all the number sentences that can be created.

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

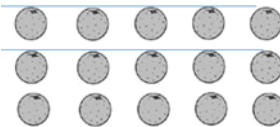
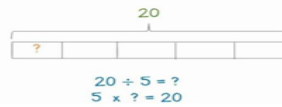
See arrays in everyday objects:



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.



Draw an array and use lines to split the array into groups to make multiplication and division sentences.

Using multiplication facts find the inverse of multiplication and division sentences by creating four linking number sentences.

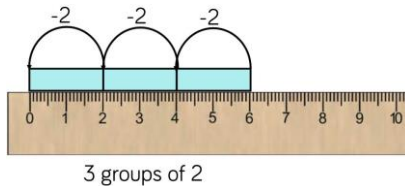
$5 \times 4 = 20$
 $4 \times 5 = 20$

$20 \div 4 = 5$
 $20 \div 5 = 4$

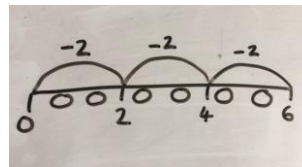
Divide 20 into 5 groups.
How many are in each group?

Division as repeated subtraction

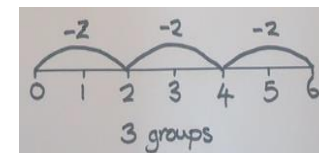
Use Cuisenaire rods above a ruler:



Children to represent repeated subtraction pictorially:



Abstract number line to show groups that have been subtracted.



Division at Milverton



Year 3

Division 2 digit by 1 digit

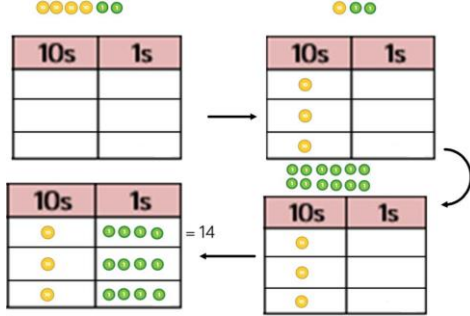
Use counting objects and resources



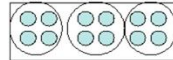
Children can divide practically $42 \div 3 = 14$
e.g. removing 3 multilink at a time from a bag of 42 multilink

Sharing using place value counters

$$42 \div 3 = 14$$

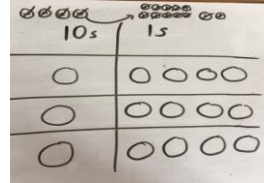


Children can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.



Encourage them to move towards counting in multiples to divide more efficiently.

Children to represent the place value counters pictorially.



Grouping/sharing counters

$$138 \div 6 = 23$$



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

$$42 \div 3$$

$$42 = 30 + 12$$

$$30 \div 3 = 10$$

$$12 \div 3 = 4$$

$$10 + 4 = 14$$

Division Facts (x3 x6 x4 x8)

Make Arrays linking multiplication facts

Draw Arrays linking multiplication facts

Quick recall of known facts.

$$36 \div 6 = 6$$

$$32 \div 8 = 4$$

$$20 \div 4 = 5$$



Division with remainders

2d+1d with remainders using lollipop sticks. Cuisenaire rods, above a ruler can also be used.

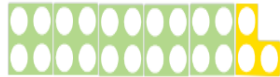
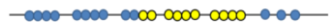
Use lollipop sticks to form wholes-squares are made because we are dividing 4.



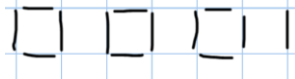
There are 2 whole squares, with 1 left over.

Using resources.

$$23 \div 4 = 5 \text{ r}3$$



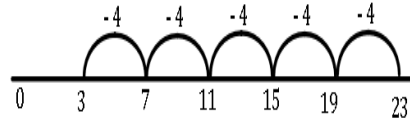
Children to represent the lollipop sticks pictorially.



There are 2 whole squares, with 1 left over

Repeated subtraction or addition along a number line

$$23 \div 4 = 5 \text{ r}3$$



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

Children should be encouraged to use their times table facts.

Begin to solve mentally.

$$23 \div 4 = \square$$

$$31 \div 6 = \square$$

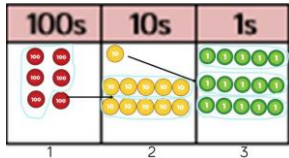
Missing number problems.

$$\square \div 3 = 4 \text{ r}1$$

$$17 \div \square = 3 \text{ r}2$$

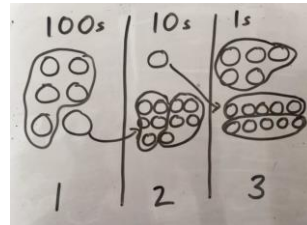
Division 3 digit by 1 digit

Short division using place value counters to group $615 \div 5$



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 do the calculation using the short division scaffold.

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

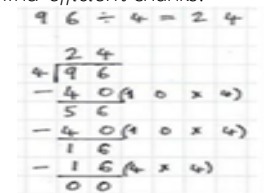
Begin with divisions that divide equally with no remainder.

Move onto divisions with a remainder.

$$\begin{array}{r} 86 \text{ r } 2 \\ 3 \overline{) 258} \\ \underline{24} \\ 16 \\ \underline{15} \\ 10 \\ \underline{9} \\ 10 \\ \underline{9} \\ 1 \end{array}$$

Using a tool kit of known facts to find *efficient* chunks.

Introduce but only with a single digit divisor. The number of groups should be recorded alongside on the right with the answer written on top:



Division at Milverton



Year 5	Division Facts (x7 x9 x11 x12)		
	Make arrays linking multiplication facts	Draw arrays linking multiplication facts	Quick recall of known facts. $21 \div 7 = 3$ $36 \div 9 = 4$ $77 \div 11 = 7$
Standard Written Method Division (4 digit by 1 digit)			
Follow processes shown in Year 4 HTO \div O with place value counters		Using a tool kit of known facts to find <i>efficient</i> chunks. The formal chunking method is Continued. Showing remainder as a whole number: $\begin{array}{r} 858r2 \\ 3 \overline{)2576} \end{array}$ Answer: 858 remainder 2 Showing remainder as a fraction: $\begin{array}{r} 858r2 \\ 3 \overline{)2576} \end{array}$ Answer: $858 \frac{2}{3}$ Also extends into decimals.	



Long Division (4 digit by 2 digit inc decimals)

Long division using place value counters

$$2544 \div 12$$

1000s	100s	10s	1s
●●	●●●●	●●●●	●●●●

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

1000s	100s	10s	1s
	●●●●●●●●	●●●●	●●●●

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

1000s	100s	10s	1s
	●●●●●●●●	●●●●●●	●●●●

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

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

1000s	100s	10s	1s
	●●●●●●●●	●●●●●●	●●●●●●

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

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

The formal chunking method is reintroduced with a two digit divisor.

$$\begin{array}{r} 327 \div 14 \\ \hline 17 \text{ r } 4 \\ 14 \overline{)327} \\ \underline{-140} \text{ (} 10 \times 14 \text{)} \\ 237 \\ \underline{-145} \text{ (} 5 \times 14 \text{)} \\ 38 \\ \underline{-38} \text{ (} 2 \times 14 \text{)} \\ 04 \end{array}$$

The final stage of chunking is for remainders to be interpreted as fractions, decimals or by rounding as appropriate to the context

$$\begin{array}{r} 432 \div 15 \\ \hline 28 \frac{4}{5} \text{ or } 28.8 \\ 15 \overline{)432} \\ \underline{-300} \text{ (} 20 \times 15 \text{)} \\ 75 \\ \underline{-75} \text{ (} 5 \times 15 \text{)} \\ 0 \end{array}$$

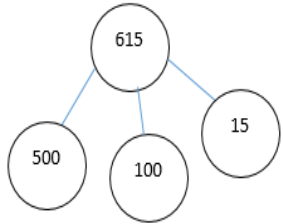
$$\frac{12}{15} = \frac{4}{5} = 0.8$$

Division at Milverton



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?



Multiplication & Division

Years 1 and 2:

groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative, sets of, equal groups, times as big as, once, twice, three times... share, share equally, one each, two each..., group, groups of, lots of, array, share, share equally, one each, two each..., group, equal groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over

Year 3 and 4:

lots of, groups of, times, multiply, multiplication, multiplied by, multiple of, product, once, twice, three times... ten times...times as (big, long, wide... and so on), repeated addition, array, row, column, double, halve, share, share equally, one each, two each, three each...group in pairs, threes... tens, equal groups of, divide, division, divided by, divided into, remainder, factor, quotient, divisible by, inverse

Years 5 and 6:

lots of, groups of, times, multiply, multiplication, multiplied by, multiple of, product once, twice, three times... ten times...times as (big, long, wide... and so on), repeated addition array, row, column, double, halve, share, share equally, one each, two each, three each...group in pairs, threes... tens, equal groups of, divide, division, divided by, divided into, dividend, divisor, remainder, factor, quotient, divisible by, inverse, fraction