
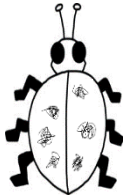
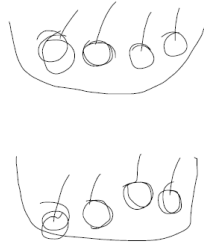


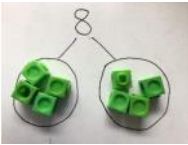


Mathematics Division Calculations Policy 2022- 2023

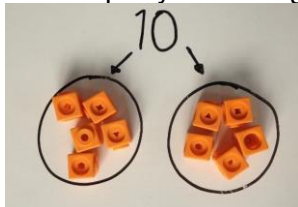
'Working together to achieve success'

	Concrete	Pictorial	Abstract
Reception Division			
Division sharing	<p>Children are encouraged to develop a mental picture of the number system in their heads to use for calculation. They should experience practical calculation opportunities involving equal groups and sharing items using a wide variety of equipment, e.g. small world play, role play, counters, cubes etc. They develop ways of recording calculations using pictures, etc.</p> 	<p>They may develop ways of recording calculations using pictures, etc.</p>  <p>A child's jotting showing halving six spots between two sides of a ladybird.</p>  <p>A child's jotting showing how they shared the apples at snack time between two groups.</p>	
Year 1 Division			
Division as sharing		<p>Children use pictures or shapes to share quantities</p>  <p>8 shared between 2 is ...</p> <p>6 football stickers are shared between 2 people, how many do they each get?</p>	<p>Share 8 buns between two people.</p> $8 \div 2 = 4$ 
Use Gordon ITPs for			

**modell
ng**

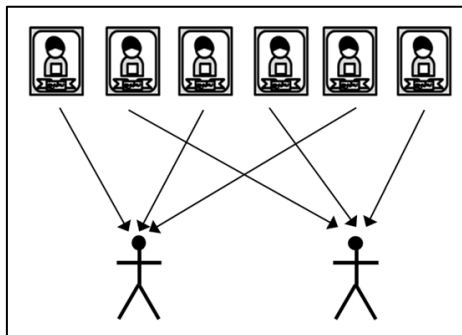


I have 10 cubes, can you share them equally into two groups?



In problem solving contexts, children will use practical equipment to share out objects equally and to group objects to represent division.

Children may solve this by using a 'one for you, one for me' strategy until all of the cards have been given out



Children should find the answer by counting how many cards **1 person** has got.

Equal grouping (How many groups of 2 are there in 6?)



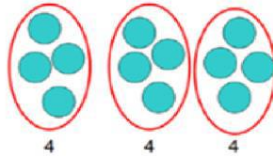
Children should find the answer by counting

how many **groups of 2** there are.

The teacher can model the link between sharing and grouping in the following way by relating back to the first football sticker question:

Placing the football stickers in a bag or box, the teacher can ask the children how many stickers would need to be taken out of the box to give each person one sticker each (i.e. 2) and exemplify this by putting the cards in groups of 2 until all cards have been removed from the bag.

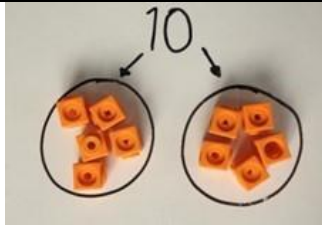
Sharing:



12 shared between 3 is 4

Year 2 Division

Division as sharing



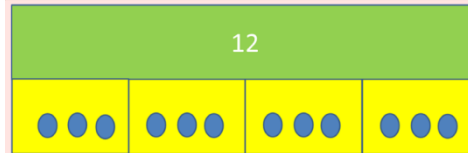
I have 10 cubes, can you share them equally in 2 groups?

Children use pictures or shapes to share quantities.



$$8 \div 2 = 4$$

Children use bar modelling to show and support understanding.



$$12 \div 3 = 4$$

Division as grouping

Children will utilise practical equipment to represent division calculations as grouping (repeated subtraction) and use jottings to support their calculation, e.g.

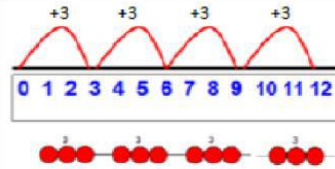
$$12 \div 3 =$$



Children need to understand that this calculation reads as 'How many groups of 3 are there in 12?'

Children should also move onto calculations involving remainders.

Use number lines for grouping



$$12 \div 3 = 4$$

$$12 \div 3 =$$



$$28 \div 7 = 4$$

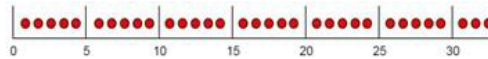
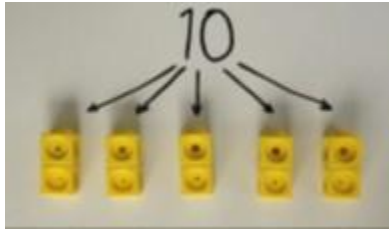
Divide 28 into 7 groups. How many are in each group?

$13 \div 4 =$

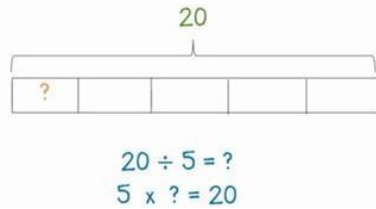


$13 \div 4 = 3 \text{ remainder } 1$

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



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.



Year 3 Division

Division as grouping

Children will continue to use grouping (repeated subtraction) to represent their calculations, answering questions such as:

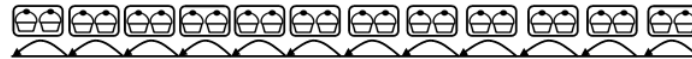
$24 \div 2 =$

or

There are 24 cupcakes, how many people can have 2 cupcakes each?



This should also be modelled alongside a number line to emphasise that grouping is repeated subtraction.



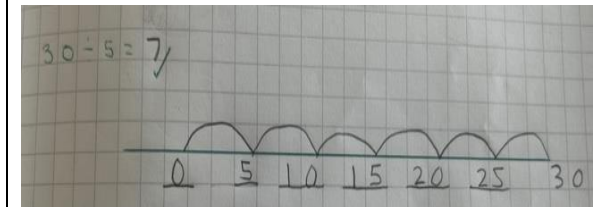
Children need to be able to decide what to do with remainders after division and round up or down accordingly. They should make sensible decisions about rounding up or down after division. For example $62 \div 8$ is 7 remainder 6, but whether the answer should be rounded up to 8 or rounded down to 7 depends on the context.

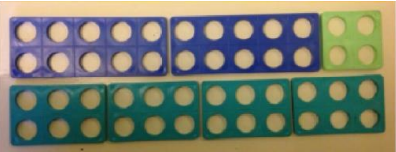



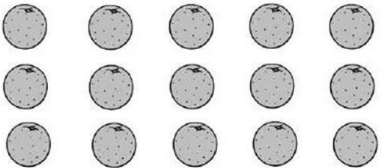
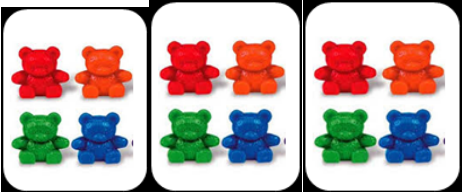


Children will continue to use grouping (repeated subtraction) to represent their calculations, answering questions such as:

$24 \div 2 =$

or

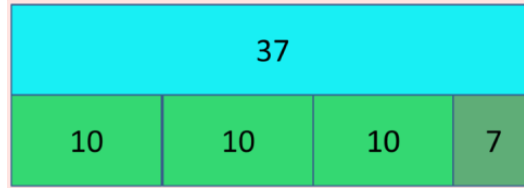
There are 24 cupcakes, how many people can have 2 cupcakes each?



<p>Division as grouping</p>	<p>Use cubes, counters, objects or place value counters to aid understanding.</p>  <p>24 divided into groups of 6 = 4</p> $96 \div 3 = 32$ 	<p>Continue to use bar modelling to aid solving division problems.</p>  <p>20 \div 5 = ? 5 x ? = 20</p>	<p>How many groups of 6 in 24? $24 \div 6 = 4$</p>
<p>Division with arrays</p>	 <p>Link division to multiplication by creating an array and thinking about the number sentences that can be created. Eg $15 \div 3 = 5$ $5 \times 3 = 15$ $15 \div 5 = 3$ $3 \times 5 = 15$</p>	<p>Draw an array and use lines to split the array into groups to make multiplication and division sentences</p> 	<p>Find the inverse of multiplication and division sentences by creating eight linking number sentences.</p> <p>$7 \times 4 = 28$ $4 \times 7 = 28$ $28 \div 7 = 4$ $28 \div 4 = 7$ $28 = 7 \times 4$ $28 = 4 \times 7$ $4 = 28 \div 7$ $7 = 28 \div 4$</p>
<p>Division with remainder</p>	<p>$14 \div 3 =$</p> <p>Divide objects between the groups and see how many are left over</p> 	<p>Jump forward in equal jumps on a number line then see how many ore you need to jump to find a remainder.</p> <p>Draw dots and group them to divide an amount and clearly show a remainder</p> 	<p>Complete written divisions and show the remainder using r</p> <p>$43 \div 8 =$</p>  <p>$43 \div 8 = 5 \text{ remainder } 3$</p> <p>Children should be able to solve real life problems including those with money and measures. They need to be able to make decisions about what to do with</p>



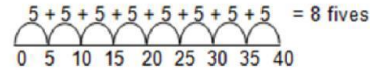
Use bar models to show division with remainders



Example without remainder:

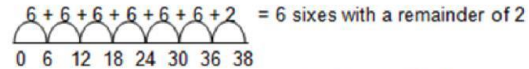
$$40 \div 5$$

Ask "How many 5s in 40?"



Example with remainder:

$$38 \div 6$$



For larger numbers, when it becomes inefficient to count in single multiples, bigger jumps can be recorded using known facts.

remainders after division and round up or down accordingly

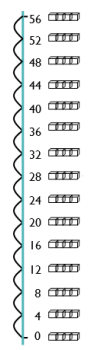
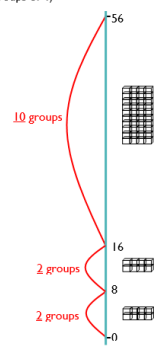
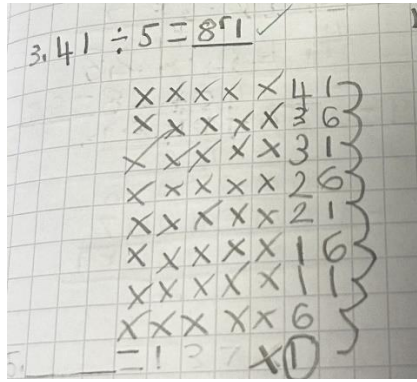
Chunking method

In preparation for developing the 'chunking' method of division, children should first use the repeated subtraction on a vertical number line alongside the continued use of practical equipment. There are two stages to this:

Stage 1 – repeatedly subtracting individual groups of the divisor

Stage 2 – subtracting multiples of the divisor (initially 10 groups and individual groups, then 10 groups and other multiples in line with tables knowledge)

After each group has been subtracted, children should consider how many are left to enable them to identify the amount remaining on the number line.

			<p>Stage 1 $56 \div 4 = 14$ (groups of 4)</p>  <p>Stage 2 $48 \div 4 = 10$ (groups of 4) + 2 (groups of 4) + 2 (groups of 4) $= 14$ (groups of 4)</p>  
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Year 4 Division

<p>Chunking method</p>			<p>Children will continue to develop their use of grouping (repeated subtraction) to be able to subtract multiples of the divisor, moving on to the use of the 'chunking' method.</p>
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10 groups

6 groups

64

24

0

$$\begin{array}{r} 16 \\ 4 \overline{) 64} \\ \underline{-40} \\ 24 \\ \underline{-24} \\ 0 \end{array}$$

Children should write their answer above the calculation to make it easy for them and the teacher to distinguish.

Children will **always** record what they are dividing by on the right-hand side of the brackets – to avoid errors when adding.

Answer: 16

The number line method used in year 3 can be linked to the chunking method to enable children to make links in their understanding.

When developing their understanding of 'chunking', children should utilise a 'key facts/What I Know' box, as shown below. This enables an efficient recall of tables facts and will help them in identifying the largest group they can subtract in one chunk. Any remainders should be shown as integers, e.g.

$$73 \div 3$$

73 ÷ 3

$$\begin{array}{r} 24r1 \\ 3 \overline{) 73} \\ \underline{-30} \\ 43 \\ \underline{-30} \\ 13 \\ \underline{-6} \\ 7 \\ \underline{-6} \\ 1 \end{array}$$

Key facts box/WIK

1x	3
2x	6
5x	15
10x	30

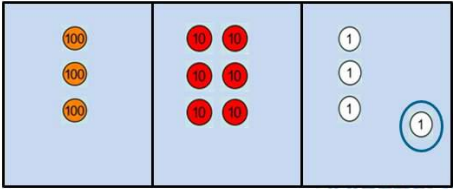
By the end of year 4, children should be able to use the chunking method to divide a three digit number by a single digit number. To make this method more efficient, the key facts in the menu box should be extended to include 4x and 20x

			<p>196 ÷ 6</p> $\begin{array}{r} 32r4 \\ 6 \overline{) 196} \\ - 120 \quad (20 \times 6) \\ \hline 76 \\ - 60 \quad (10 \times 6) \\ \hline 16 \\ - 12 \quad (2 \times 6) \\ \hline 4 \end{array}$ <p>Key facts box</p> <table border="1"> <tr><td>1x</td><td>6</td></tr> <tr><td>2x</td><td>12</td></tr> <tr><td>4x</td><td>24</td></tr> <tr><td>5x</td><td>30</td></tr> <tr><td>10x</td><td>60</td></tr> <tr><td>20x</td><td>120</td></tr> </table> <p>Children should write key facts in a menu box. This will help them in identifying the largest group they can subtract in one chunk.</p> <p>Children should write their answer above the calculation to make it easy for them and the teacher to distinguish.</p> <p>Any remainders should be shown as integers, i.e. 14 remainder 2 or 14 r 2.</p> <p>Children should be able to solve real life problems including those with money and measures. They need to be able to make decisions about what to do with remainders after division and round up or down accordingly. When appropriate, children will progress to the 'bus stop' method.</p>	1x	6	2x	12	4x	24	5x	30	10x	60	20x	120
1x	6														
2x	12														
4x	24														
5x	30														
10x	60														
20x	120														

Year 5 Division		
Chunking method		<p>Children can start to subtract larger multiples of the divisor (e.g. 20x).</p> <p>Short division (HTU ÷ U)</p>

			<p>$196 \div 6$</p> $\begin{array}{r} 32r4 \\ 6 \overline{) 196} \\ - 120 \quad (20 \times 6) \\ \hline 76 \\ - 60 \quad (10 \times 6) \\ \hline 16 \\ - 12 \quad (2 \times 6) \\ \hline 4 \end{array}$ <p>Key facts box</p> <table border="1"> <tr><td>1x</td><td>6</td></tr> <tr><td>2x</td><td>12</td></tr> <tr><td>4x</td><td>24</td></tr> <tr><td>5x</td><td>30</td></tr> <tr><td>10x</td><td>60</td></tr> <tr><td>20x</td><td>120</td></tr> </table> <p>The key facts in the menu box should be extended to include 4x and 20x.</p> <p>Any remainders should be shown as integers, i.e. 14 remainder 2 or 14 r 2.</p> <p>Children need to be able to decide what to do after division and round up or down accordingly. They should make sensible decisions about rounding up or down after division. For example $240 \div 52$ is 4 remainder 32, but whether the answer should be rounded up to 5 or rounded down to 4 depends on the context.</p> <p>Children also use the related key facts to find 100x, 300x, etc.</p>	1x	6	2x	12	4x	24	5x	30	10x	60	20x	120
1x	6														
2x	12														
4x	24														
5x	30														
10x	60														
20x	120														

Year 6 Division

<p>Short Division</p>	<p>$364 \div 3 =$</p> $\begin{array}{r} 121 \text{ rem } 1 \\ 3 \overline{) 364} \end{array}$ 		<p>Begin with divisions that divide equally with no remainders.</p> $\begin{array}{r} 218 \\ 4 \overline{) 872} \\ \hline 8 \quad 7 \quad 2 \end{array}$ <p>Move onto remainders</p>
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$$\begin{array}{r} 86 \text{ r } 2 \\ 3 \\ \hline 5 \overline{) 432} \end{array}$$

Finally move onto decimal places to divide the total accurately

$$\begin{array}{r} 0663 \text{ r } 5 \\ 8 \overline{) 5350^29} \end{array}$$

Moving on to having a decimal answer rather than a remainder.

$$487 \div 4$$

		1	2	1	7
	4	4	8	7	0

Division

