

Division Calculation Policy

Early Years

Children explore sharing through practical sharing using real life scenarios including sharing fruit or classroom equipment. They are introduced to the term half.

Numerical patterns ELG: [Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.](#)

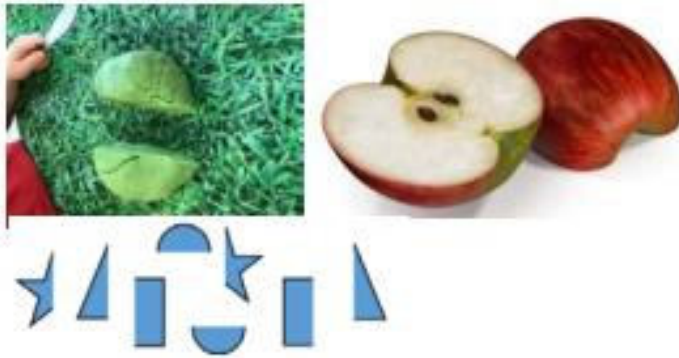
Vocab for Division: share, sharing, half, equal, parts, whole, share equally, one each, fair

	Steps in learning for Division (Sharing)	Explanatory note
Introduction to sharing	<p>Within play children will begin to explore sharing and begin to explore the concept of fairness. This may involve giving objects to other children or giving objects to teddy or dolly. Children will use real life objects, toys and other maths resources to share. Once again, one to one correspondence is a key prerequisite skill.</p> <p>Step 1 I can give out objects</p> <ul style="list-style-type: none">• They will take turns to give objects to people• Give out one at a time. <p>Step 2 I can give out objects fairly</p> <ul style="list-style-type: none">• Children will be taught the concept of fairness e.g. by giving one person 3 sweets and another person 1 sweet. They will talk about whether this is fair and how important it is that everyone has the same amount if we want to share equally. <p>Step 3 I can share objects and count how many each person was given</p> <ul style="list-style-type: none">• Having established the skill of giving objects out children need to learn how to check that each person has received the correct amount. This should still be play based and involve practical objects (Up to 12 objects)• Take turns to give out objects• Give one object out at a time until there are none left• Count each person's total• Check each person's total is the same.	



Understand and recognise a half

Children will have the opportunity to physically cut objects, food, playdough or shapes in half. They should be taught that a half is one of 2 equal parts. This can also be linked to language in capacity e.g. half full and folding paper in half checking that both parts are the same.

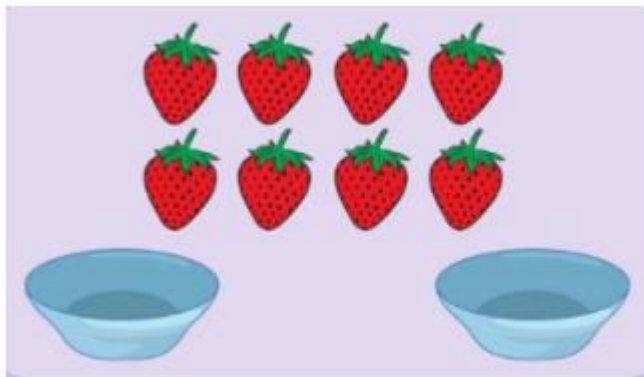


Finding half of a number (Even numbers)

Children will begin to link halving to sharing into 2 equal groups. Children will complete this practically using a variety of real life objects, hoops, cubes e.g. Finding half of 8 by sharing 8 strawberries into 2 bowls.

Step 4 I can share an even number of objects between 2 people

- Take turns to give one person one at a time
- Check that both people have the same amount



Step 5- I can halve an even number of objects

- The main difference with this step is that the teacher will use the language halving during the activity. Children should be taught when we halve a number we share into 2 equal groups (link to a half being one of two equal parts)
- Take turns to give one person one at a time
- Check that both people have the same amount
- Count how many one person has. This is one half.

Year 1

In Year 1, children continue to encounter halving and link this with their understanding of sharing. In Year 1 children solve problems by sharing into equal groups. They are not expected to record division formally or see and understand the division sign. There should be lots of physical, practical sharing first before moving to the pictorial method.

Overarching objective: Solve one step problems involving division using practical resources/pictorial representations with support from the teacher.

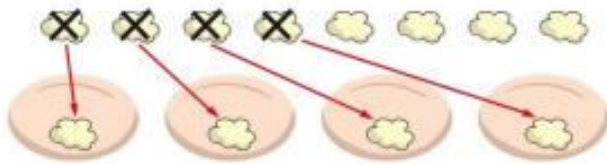
For example:

There are 20 apples altogether.
They are shared equally between 5 bags.
How many apples are in each bag?

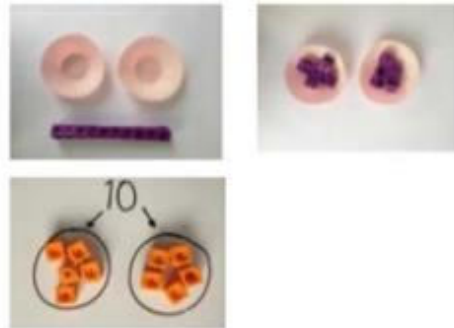
Concrete and practical resources

Main strategy
Division as sharing
(Sharing objects in to equal groups)

In Year 1 children explore sharing. They share objects into equal groups, one at a time and then work out how many are in each group. They use practical objects to physical share and work out the answer. e.g. 8 shared by 4 = 2



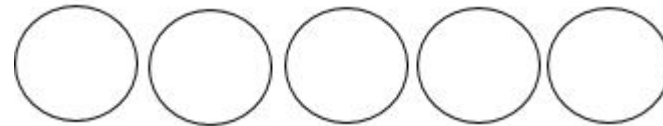
e.g. 10 shared by 2 = 5



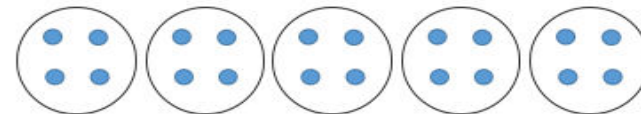
Pictorial / Jottings


Children begin to record sharing by drawing circles for the number of groups. e.g. 20 apples are shared between 5 bags. How many apples are in each bag?

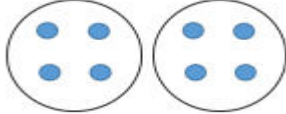
Children draw 5 circles to represent the bags



They draw one dot in each circle to represent the apples as they share them out, stopping at 20. They then check all groups are equal and count how many in **one** group.



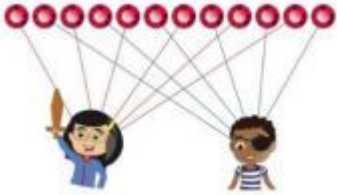
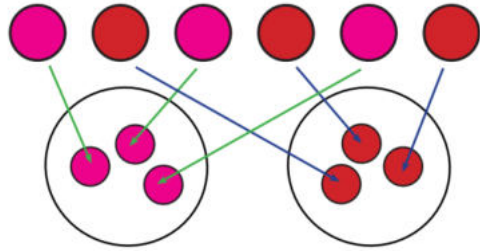
<p>Recognise a half Link to fractions work ½, half past in time)</p>	<p>See Earlier Practical work on halves in Early Years</p>	<p>Children recognise shapes that are half not a half</p> 
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<p>Find half of a number Link to work on fractions</p>	<p>See Earlier practical work in Early Years Children link halving to sharing between 2</p>	<p>Jottings Children link halving to sharing between 2. They can move to jotting in two circles to work out the half. e.g. half of 8 is 4</p> <p>Draw 2 circles and make jotting in the circles as they share out.</p> 	<p>Abstract- Link to Y1 learn its</p> <p>Recall doubles of numbers to 10 and their <u>corresponding halves</u></p>
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Year 2

In Year 2 children revisit sharing briefly but move to explore division through grouping. Children solve problems by grouping and counting the number of groups they have made. They are introduced to the division sign and write number sentences containing the division sign. When grouping links can be made back to equal and unequal groups taught in the multiplication block.

Overarching Objective: Solve problems involving division, using materials, arrays and division facts, including problems in contexts.

<p>Revisit sharing</p>	<p>Concrete and practical resources See Year 1 examples. Children use practical objects before moving to jottings. They start with the whole and share into groups one at a time</p>  <p>12 shared equally between 2. They get 6 each.</p>	<p>Pictorial / Jottings See Y1 examples. Children use jottings to share 6 by 2. Drawing two circles then counting how many are in each circle.</p>  <p>6 shared by two is three each.</p>
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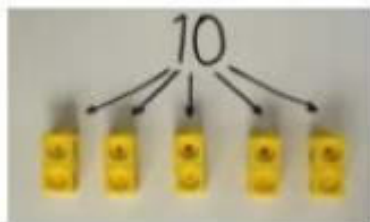
Main strategy

Division through grouping

Introduction of the \div sign (Find how many groups of)

Children begin to understand how division can also relate to **grouping**. They will divide quantities into equal groups. Children will use counters, cubes and real life objects so they can physically manipulate the resources and create the groups. They count **how many equal groups they have made** to find the answer.

For example $10 \div 2 = 5$
(How many groups of 2 in 10?)



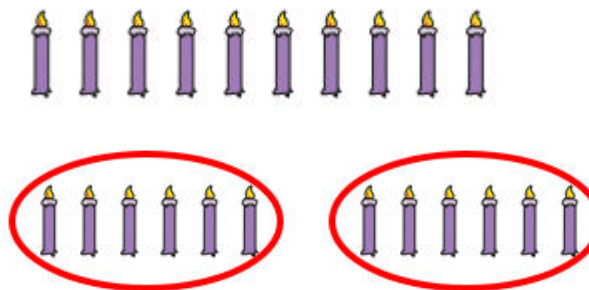
- Set out the correct number in the starting pile (first number)
- \div tells us we need to split/divide into equal groups
- The second number tells us what size of smaller groups we need to make.
- Make equal groups of the second number until all the starting pile as gone.
- Count how many groups we have made to find the answer.

When children are confident practically they can move to using pictures and jottings.

Pictorial

For example. $10 \div 5 = 2$
(How many groups of 5 in 10?)

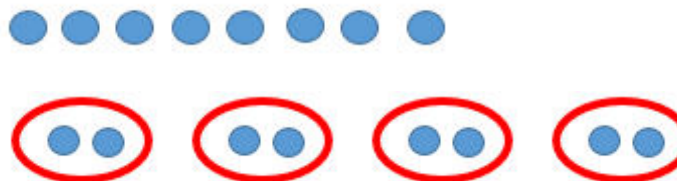
Children create their own groups of 5 by circling groups of 5 candles and counting how many groups they have made.



Jottings

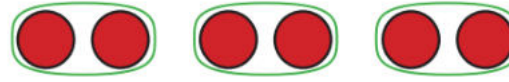
For example $8 \div 2 = 4$
(How many groups of 2 in 8.)

Children draw out 8 dots then circle them in to equal groups of 2.



There are 4 groups of 2 in 8.

e.g. $6 \div 2 =$



"How many groups of
2 can I make out of 6?
Answer: 3

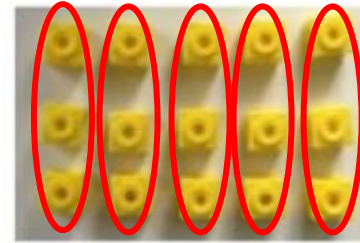
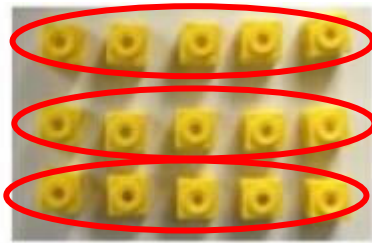
$$6 \div 2 = 3$$

Arrays

To recognise
the \div sign

Calculate
mathematical
statements for
division and
write them
using the
division sign \div
and equal =
sign.

Children link division back to their earlier work on arrays in multiplication. They can create their own arrays thinking about the groups they can see to write division facts. They can also be given pre-drawn arrays, drawing the groups they can see and writing the division facts.



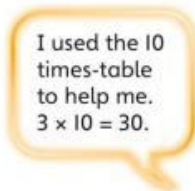
e.g. Talk about what equal groups they can see.
15 cubes in equal groups of 5 is 3 groups $15 \div 5 = 3$
15 cubes in equal groups of 3 is 5 groups $15 \div 3 = 5$

Recall and use
division facts
for the 2, 5
and 10.
multiplication
tables

Children will relate times table knowledge directly to division and fact families work.

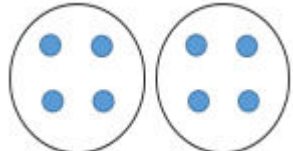
e.g $30 \div 10 =$

$1 \times 10 = 10$
 $2 \times 10 = 20$
 $3 \times 10 = 30$
 $4 \times 10 = 40$
 $5 \times 10 = 50$
 $6 \times 10 = 60$
 $7 \times 10 = 70$
 $8 \times 10 = 80$



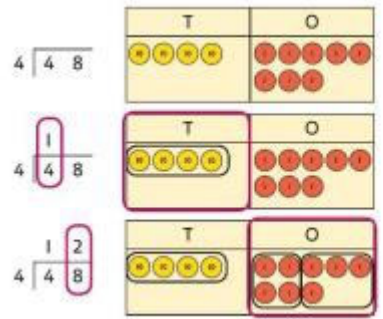
I know that 3 groups of/ lots of ten makes 30, so I know that 30 divided by equal groups of 10 will be three
 $3 \times 10 = 30$ so $30 \div 10 = 3$

This should also be linked to weekly times tables test and speed recall of division facts.

<p>Find half of a number and recall key halves</p> <p>Link to fractions work</p>		<p>As in Y1. Children link halving to sharing between 2. They can move to jottings in two circles to work out the half. e.g. half of 8 is 4</p> <p>Draw 2 circles and make jotting in the circles as they share out.</p> 	<p><u>Link to previously taught learn its</u></p> <p>Consolidate and increase speed of recall of Y1 learn its. Recall doubles of numbers to 10 and their corresponding halves.</p>
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Year 3

In Year 3 children are taught to divide two digit numbers by a single digit number. They should be introduced to the short formal written method (Bus stop method). When using this method they will continue to use grouping. Starting with the largest place value they group by the divisor. Language is very important here e.g. Children should ask how many groups of _____ can we make?

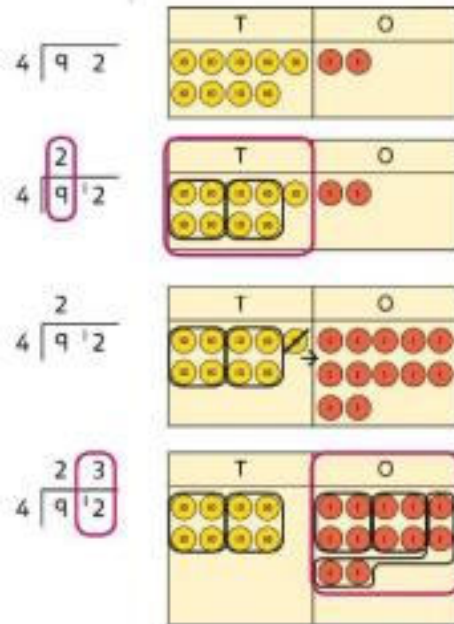
<p>Divide a 2d x 1d number (No exchange)</p> <p>(Using x table facts they know)</p>	<p style="text-align: center;"><u>Teaching method</u></p>  <ul style="list-style-type: none"> • Lay out or draw out the numbers on the place value grid • Look at the tens- How many groups of 4 can you make out of 4 tens? 1 group • Look at the ones- How many groups of 4 can you make out of 8 ones? 2 groups • There is 1 group of 4 in 4 tens and there are 2 groups of 4 in 8 ones. • How many groups of 4 in 48? 12 	<p>Children will be taught the short written method. This will be explained using a place value grid and equipment or jottings alongside the short division method to aid understanding. The model will focus upon grouping (See teaching method). Start with no exchange. The children should only use times tables facts that they are familiar with.</p> <p>e.g.</p> $\begin{array}{r} 12 \\ 3 \overline{)36} \end{array}$
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Divide a 2d x 1d number (With exchange)

(Using x table facts they know)

Teaching method

Work with divisions that require exchange e.g. $92 \div 4 =$



- Lay out or draw out the numbers on the place value grid
- Look at the tens- How many groups of 4 can you make from 9 tens? 2 groups of 4 tens with 1 ten left over.
- Exchange the one ten left over for ten ones. We now have 12 ones.
- Look at the ones- How many groups of 4 can you make from 12 ones? 3 groups of 4 ones.
- How many groups of 4 in 92? 23

Once children are confident with the short written method without exchange extend to incorporate exchange in the tens. This will be explained using the place value grid and equipment or jottings alongside the short division method to aid understanding.

Use short formal method to work out calculations such as:

$$72 \div 4 = 18$$

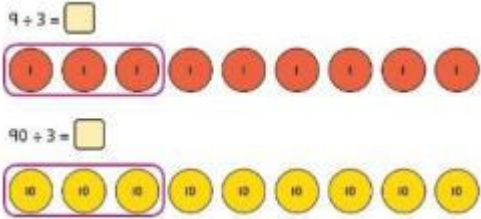
$$4 \overline{) 72} \begin{matrix} 18 \\ 3 \end{matrix}$$

Recall and use division facts for the 3, 4 and 8 tables.

Children will relate times table knowledge directly to division and fact families work.

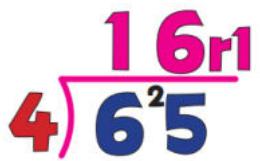
e.g. If I know $3 \times 4 = 12$ I also know $12 \div 3 = 4$ and $12 \div 4 = 3$

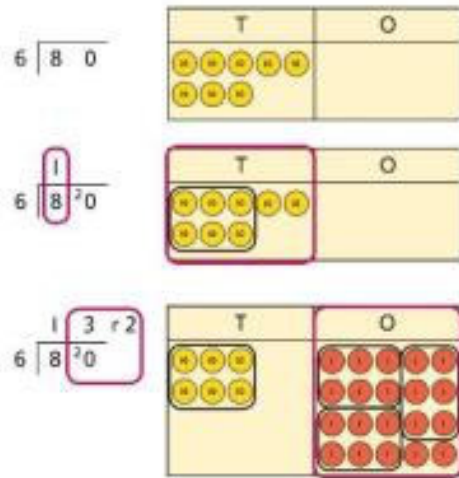
This can also be related back to their work on arrays in Y2 with both multiplication and division facts.

	This should also be linked to weekly timetables tests and speed recall of division facts.	
<p>Dividing multiples of ten by a single digit</p> <p>Use known facts to divide multiples of 10</p>	<p>Children can explore the relationships between division facts and scaling by 10 using place value equipment or base ten</p>  <p>If $9 \div 3 = 3$ then $90 \div 3 = 30$</p>	<p>Divide multiples of 10 by single digits using known times tables facts</p> <p>e.g. $18 \div 3 = 6$ $180 \div 3 = 60$ 18 divided by 3 is 6 then 18 tens divided by 3 is 6 tens</p> <p>Use known facts to divide 10s and 100s by a single digit.</p> <p>e.g. $15 \div 3 = 5$ $150 \div 3 = 50$ $1500 \div 3 = 500$</p>
Recall key halves		<p><u>Link to Year 3 learn its</u></p> <p>Derive doubles of multiples of 10 and their corresponding halves- See Learn its</p>

Year 4

In Year 4 children will revisit 2 digit by one digit division but this time they will be introduced to the concept of remainders. Children will continue to use grouping to support their understanding of short division when dividing a three digit number by a single digit number. They should be already familiar with the short formal written method from Year 3.

<p>Divide a 2d x 1d number (With remainders)</p> <p>(Using x table facts they know)</p>	<p style="text-align: center;"><u>Teaching method</u></p> <p>Use short division and understand remainders as the last remaining 1s e.g. $80 \div 6 =$</p>	<p>Extend earlier work in Year 3 to incorporate remainders. This will be explained using the place value grid and equipment/jottings alongside the short division method to aid understanding.</p> <p>Use short formal method to work out calculations such as:</p> $65 \div 4 = 16r1$ 
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- Lay out or draw out the numbers on the place value grid
- Look at the tens- How many groups of 6 can you make from 8 tens? 1 group of 6 tens with 2 tens remaining.
- Exchange the two tens left over for twenty ones. We now have 20 ones.
- Look at the ones- How many groups of 6 can you make from 20 ones? 3 groups of 6 ones.
- There are 2 ones remaining.
- How many groups of 6 in 80? 13 with 2 remaining.

Divide 3 digit numbers by one digit numbers using a formal written layout (No exchange, exchange, remainders)

Teaching method

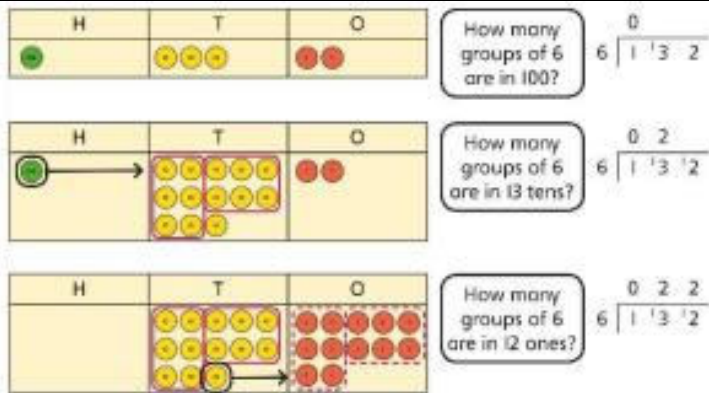
Start with examples of 3 digit numbers divided by 1 digit numbers when there is no exchange. This can be extended to including an exchange and then finally when confident with remainders

Children continue to use the formal short method to divide 3 digits by 1 digit. Children should start with questions that involve no exchange e.g. $484 \div 4 =$ and $624 \div 2 =$. Exchange should be built in within the different place holders, e.g. $856 \div 4 =$, $723 \div 3 =$, $186 \div 6 =$

e.g. $136 \div 4 =$

$$136 \div 4 = 34$$

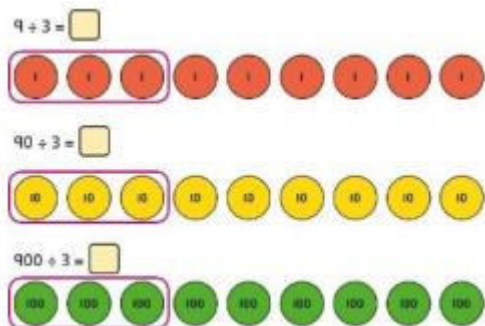
$$4 \overline{)136}$$



See Year 3 for Language.

Dividing multiples of 10 and 100 by a single digit

Children can explore the relationships between division facts and scaling by 10 using place value equipment or base ten



If $9 \div 3 = 3$ then $90 \div 3 = 30$ and $900 \div 3 = 300$

Use known facts to divide 10s and 100s by a single digit. If I know $3 \times 5 = 15$ I also know.....

- e.g.
 $15 \div 3 = 5$
 $150 \div 3 = 50$
 $1500 \div 3 = 500$

I also Know...

- $15 \div 5 = 3$
 $150 \div 5 = 30$
 $1500 \div 5 = 300$

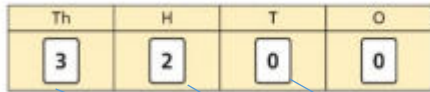
Divide whole numbers by 10/100 and know this makes the number 10/100 times smaller

Use place value grids to explore the movement of digits when dividing numbers by 10 and 100
 Children will use place value grids to understand how the digits move and change when dividing by 10 and 100. They will understand 0 as a place holder.

When dividing by 10 digit will move one place to the right as the numbers get smaller.

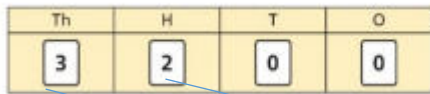
Children to be able to apply their place value knowledge to divide numbers by 10 and 100 including finding missing numbers to answer questions such as:

Dividing by 10	Dividing by 100
$320 \div 10 =$	$700 \div 100 =$
$9300 \div 10 =$	$5200 \div 100 =$
$\underline{\quad} \div 10 = 200$	$\underline{\quad} \div 100 = 8$
$15 = \underline{\quad} \div 10$	$21 = \underline{\quad} \div 10$



$$3200 \div 10 = 320$$

When dividing by 100 digit will move two places to the right as the numbers get smaller.



$$3200 \div 100 = 32$$

Recall division facts for tables up to 12 x 12

Children should develop their understanding the relationship between multiplication and division, including times-tables and fact families



If $4 \times 6 = 24$ then $6 \times 4 = 24$ and $24 \div 4 = 6$ and $24 \div 6 = 4$

This should also be linked to weekly timetables tests and speed recall of division facts.

Recall key halves

Link to learn its

- Double numbers to 100 and halve any even number to 100

Halving 2 digit numbers can be taught through partitioning
For example: What is half of 54?

$$50 + 4 = 54$$



$$25 + 2 = 27$$

Year 5

In Year 5 children will continue to use grouping to support their understanding of short division when dividing a four digit number by a single digit number. When children are dividing numbers with multiple exchanges they should not still be reliant on concrete or practical resources and have a good understanding of the written method.

Understanding factors and prime numbers

Use equipment to explore factors of a given number



$$24 \div 3 = 8$$

$$24 \div 8 = 3$$

8 and 3 are factors of 24 because they divide 24 exactly.

$$24 \div 5 = 4 \text{ remainder } 4.$$



5 is not a factor of 24 because there is a remainder.

Understand that Prime numbers are numbers with exactly two factors.

$$13 \div 1 = 13$$

$$13 \div 2 = 6 \text{ r } 1$$

$$13 \div 4 = 4 \text{ r } 1$$

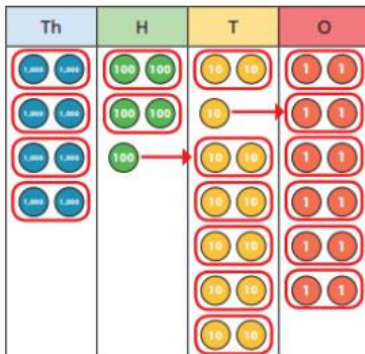
1 and 13 are the only factors of 13. 13 is a prime number.

Recognise and know primes up to 100. Understand that 2 is the only even prime number and that 1 is not a prime number.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

Divide numbers up to 4 digits by a one digit number using a formal written layout (With remainders)

Teaching method



	4	2	6	6
2	8	5	13	12

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

Children to use the formal short method to divide 4 digits by 1 digit. The process should be explained alongside the teaching method and place value chart shown previously. Children should start with questions that involve no exchange e.g. $2484 \div 2 =$ Exchange should be built in within the different place holders, e.g. $3642 \div 3 =$ $8604 \div 4 =$, $7269 \div 3 =$ until children are confident exchanging in any position.

For example

$$5978 \div 3 = 854$$

$$\begin{array}{r} 854 \\ 7 \overline{) 5978} \end{array}$$

See earlier Year groups for language to be used.

Remainders then can be built in. Children should be taught how to interpret remainders in real life contexts to answer questions such as:

- 266 children are going to the pantomime. Each minibus sits 8 people. How many minibuses are needed to get all the children to the pantomime? **The answer is 33 r2 so 34 minibuses will be needed.**
- There are 266 crème eggs packed in boxes of 8. How many full boxes of eggs are there? **The answer is 33 r 2 so there are only 32 full boxes.**

Divide numbers mentally drawing upon known facts

Use known facts to divide numbers mentally.

Answer questions such as:

Known fact: If I know $12 \div 4 = 3$

I can work out $120 \div 4 = 30$ $1200 \div 4 = 300$ $120 \div 40 = 3$ $1200 \div 400 = 3$

Use known facts to divide decimals by scaling by 0.1 and 0.01.

Answer questions such as:

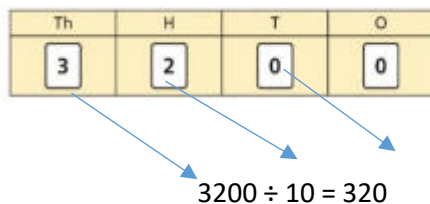
Known fact: If I know $12 \div 4 = 3$

I can work out $1.2 \div 4 = 0.3$ $1.2 \div 3 = 0.4$ $0.12 \div 4 = 0.03$ $0.12 \div 3 = 0.04$

Divide whole numbers by 10, 100 and 1000

Children will use place value grids to understand how the digits move and change when dividing by 10, 100 and 1,000. They will understand 0 as a place holder.

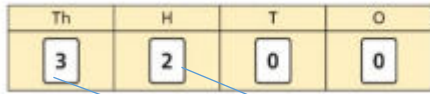
When dividing by 10 digit will move one place to the right as the numbers get smaller.



Children work mentally to answer questions such as

	$\div 10$	$\div 100$	$\div 1000$
365			
432			
1230			

When dividing by 100 digit will move two places to the right as the numbers get smaller.



$$3200 \div 100 = 32$$

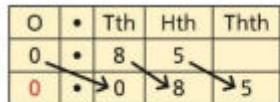
When dividing by 1000 digits will move 3 places to the right

Dividing decimals by 10, 100 and 1000
(linked to converting standard units in measure)

Understand the movement of digits on a place value grid

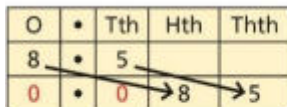
- ÷ 10 – digits move one place to the right.
- ÷ 100 – digits move two places to the right.
- ÷ 1000 – digits move three places to the right.

For example: $0.85 \div 10 = 0.085$



$$0.85 \div 10 = 0.085$$

For example: $8.5 \div 100 = 0.085$



$$8.5 \div 100 = 0.085$$

Children to mentally answer questions such as

	÷10	÷100	÷1000
36.5			
62.5			
1.30			
132.4			

Recall Key halves

Linked to Double learn its

Recall key halves: half of 30, 50, 150, 200, 300, 350, 500, 1500, 2000, 2500, 3000, 3500, 5000, 10000

Recall key halves: 3, 5, 7, 9, 15, 25

Year 6

In Year 6 children are introduced to long written method of division. They secure all previously taught strategies and facts and should be very confident using the formal written method of short division to divide numbers up to 4 digits. When the divisor is above 12 the long method of multiplication will be taught.

Divide numbers up to 4 digits by a two digit whole number using the formal written method of short division. (x 11 and x12 tables only)

When children divide numbers up to 4 digits by either 11 or 12 the formal written method of short division will still be used.

$$432 \div 12 = 36$$

		0	3	6
	12	4	4	3
			7	2

Divide numbers up to 4 digits by a two digit whole number using the formal written method of long division. (Divisor above 12)

Method 1

The method will continue to focus upon grouping and children asking how many groups of the divisor will fit into the dividend. Now children find the largest amount of groups that can be made. Coin cards can be used to generate larger multiples and other key facts that may be needed to solve the problem.

For example: $3640 \div 15 =$

Coin card

1	15
2	30
5	75
10	150
20	300
50	750
100	1500
200	3500

Method 2

For example: $3640 \div 15 =$

$$\begin{array}{r} 2 \\ 15 \overline{) 3640} \\ \underline{- 30} \\ 6 \end{array}$$

15 into 3 doesn't go, so look at the next digit.

15 goes into 36 two times, so put a 2 above the 6.
 $15 \times 2 = 30$

Take that 30 away from the 36 to get your remainder.
 $36 - 30 = 6$

$$\begin{array}{r} 24 \\ 15 \overline{) 3640} \\ \underline{- 30} \\ 64 \\ \underline{- 60} \\ 4 \end{array}$$

Next, carry the 4 down to make 64.
15 goes into 64 four times, so put a 4 above the 4.
 $15 \times 4 = 60$

Take 60 from the 64 to get your remainder.
 $64 - 60 = 4$

$$\begin{array}{r} 242 \\ 15 \overline{) 3640} \\ \underline{- 30} \\ 64 \\ \underline{- 60} \\ 40 \\ \underline{- 30} \\ 10 \end{array}$$

Carry the 0 down to make 40.

15 goes into 40 two times, so put a 2 above the 0.
 $15 \times 2 = 30$

Take 30 from the 40 to get your remainder.
 $40 - 30 = 10$

D - Divide

M - Multiply

S - Subtract

B - Bring down

Working out

			2	4	2	r	1	0
1	5	3	6	4	0			
	-	3	0	0	0		200x	
		6	4	0				
	-	6	0	0			40x	
			4	0				
	-		3	0			2x	
			1	0	r			

Divide numbers by 10, 100 and 1,000 giving answers up to three decimal places

To be confident in the movement of digits on a place value grid.

- ÷ 10 – digits move one place to the right.
- ÷ 100 – digits move two places to the right.
- ÷ 1000 – digits move three places to the right.

Eg. $28.21 \div 10 = 2.821$

T	O	.	Tth	Hth	Thth
2	8	.	2	1	
0	2	.	8	2	1

$723.56 \div 100 = 7.2356$

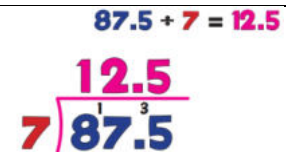
H	T	O	.	Tth	Hth	Thth	TTthths
7	2	3	.	5	6		
0	0	7	.	2	3	5	6

Children to mentally answer questions such as

	÷ 10	÷ 100	÷ 1000
34.57			
12.53			
782.36			
563.897			

Divide numbers with up to 2 decimal places by one and two digit whole numbers

Use formal short and long written methods.
Link to money and measure.

$$87.5 \div 7 = 12.5$$


$$31 \overline{) 381.3}$$
