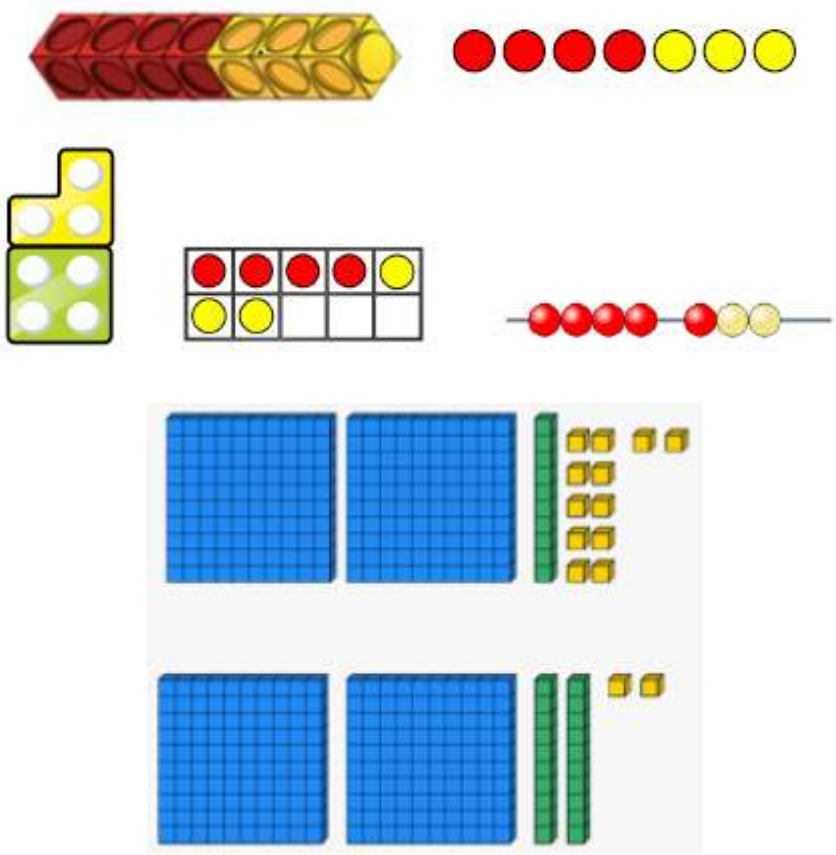
Nightingale Primary School

Calculation policy

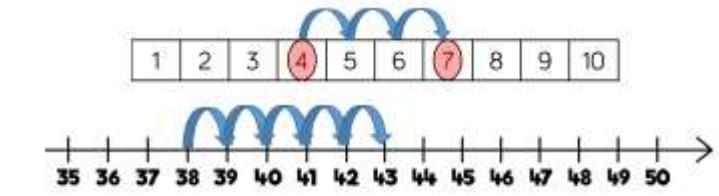
Addition

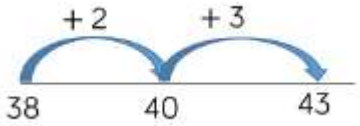


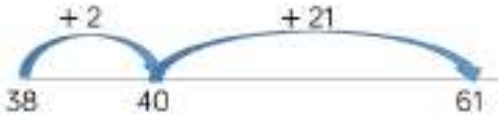
Concrete resources/ pictorial representations.

Children use concrete resources to practically add numbers together. They also move on to draw these out pictorially. Children use a range of counters, cubes, base 10/ dienes, number beads, numicon and tens frames.).

Alongside mental methods, children should look for number bonds to 10 or doubles to add number efficiently.





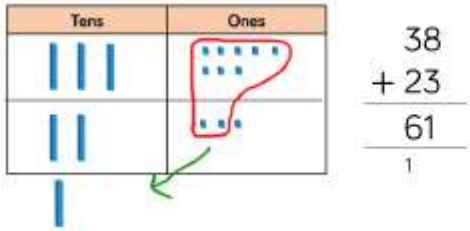


Number lines-

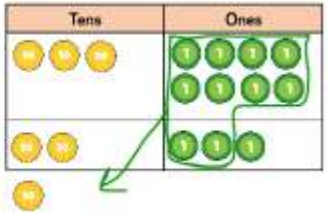
When adding single digits to two-digit numbers children are encouraged to count on from the largest number.

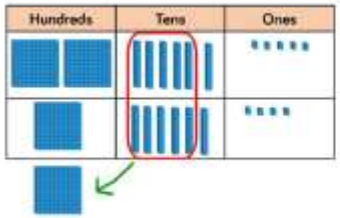
They start by counting on in ones and also use number bonds to become more efficient.

Children move onto using a blank number line to count on to find the total.

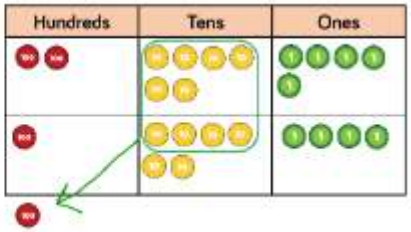


$$\begin{array}{r} 38 \\ +\ 23 \\ \hline 61 \\ {\scriptstyle 1} \end{array}$$





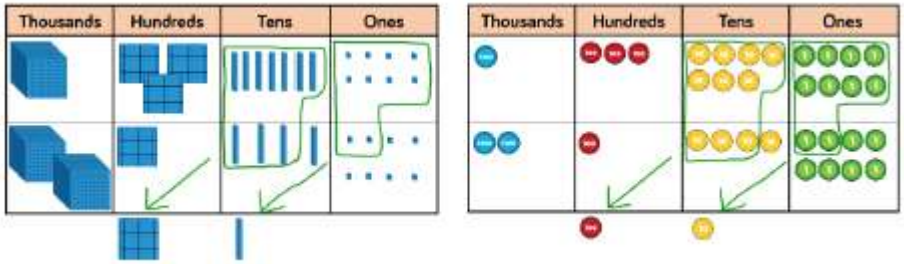
$$\begin{array}{r} 265 \\ +\ 164 \\ \hline 429 \\ {\scriptstyle 1} \end{array}$$



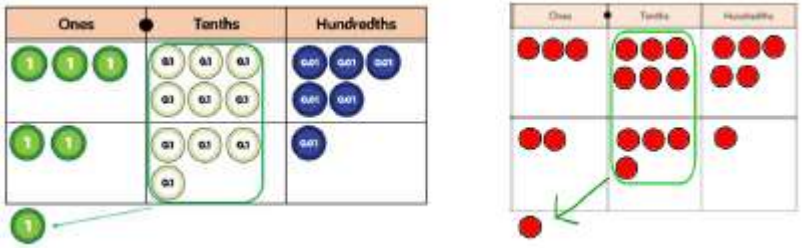
Column addition-

Children begin to use the column method alongside base 10 (dienes) and place value counters.

From Year 3, when exchanging using the column method, children learn to exchange in small steps. First with one exchange from the ones to the tens column, then from the tens to the hundreds column. Next, they



	1	3	7	8
+	2	1	4	8
	3	5	2	6
	1	1		



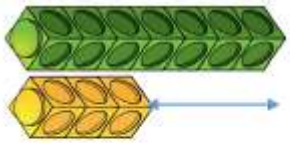
$$\begin{array}{r} 3.65 \\ +\ 2.41 \\ \hline 6.06 \\ \hline 1 \end{array}$$

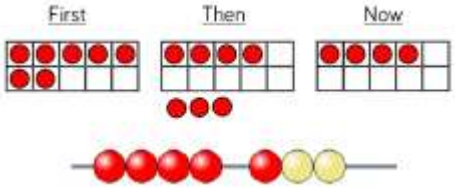
can make 2 exchanges in both he ones and tens columns and so on.

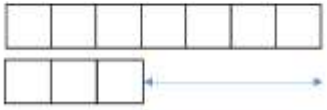
Children will draw the answer box and exchange below as shown.

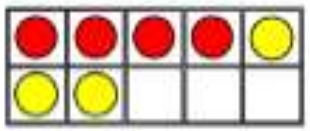
From Year 5, children learn to add decimals in contexts using money and measure using the column method (alongside place value counters to start).

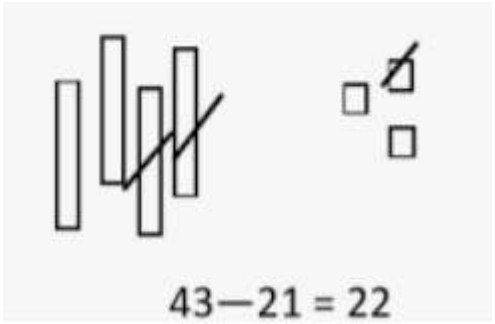
Subtraction







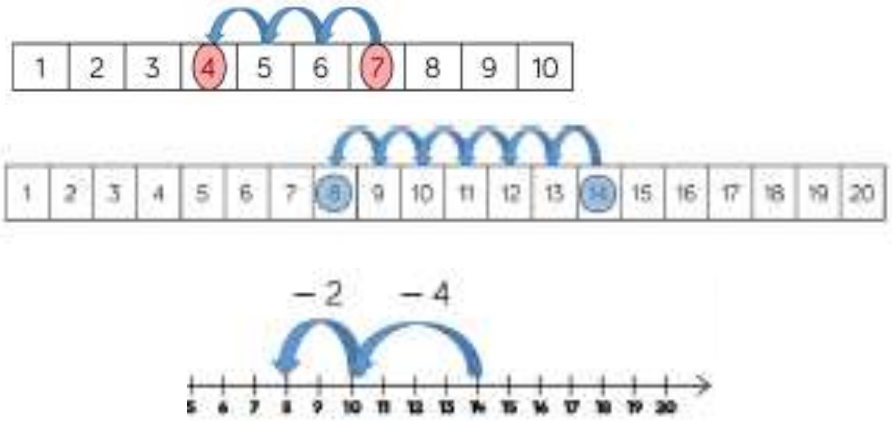




Concrete resources/ pictorial representations.

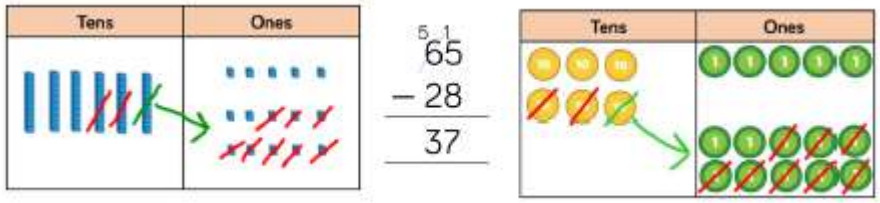
Children use concrete resources to practically subtract numbers from one another. They also move on to draw these out pictorially and cross them out.. Children use a range of counters, cubes, base 10/ dienes, number beads, numicon and tens frames.).

Alongside mental methods, children should look for number bonds to 10 or halves to subtract number efficiently.



Number lines-

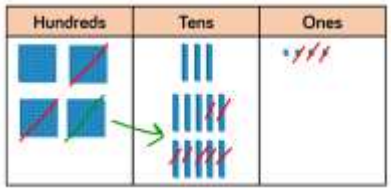
Children use number lines to count back in ones to subtract. Then then use number bonds to jump back in more efficient jumps.



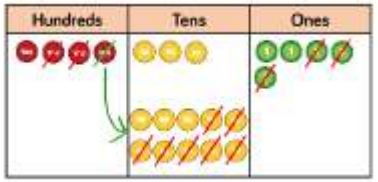
Column Subtraction-

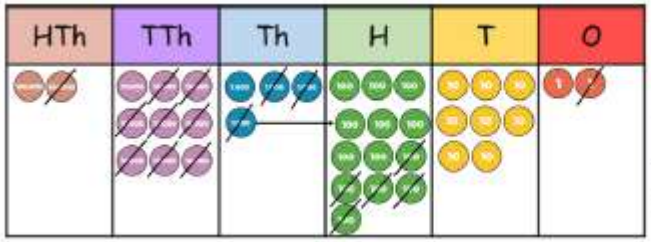
Children begin to use the column method alongside base 10 (dienes) and place value counters to subtract.

From Year 3, when exchanging using the column method, children learn to exchange in small steps. First with one exchange from the tens to the ones column,



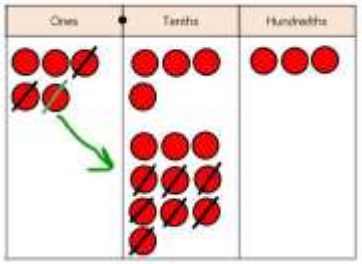
$$\begin{array}{r} {}^{3}\cancel{4}{}^{1}35 \\ -\ 273 \\ \hline 262 \end{array}$$





	2	9	$^{5}\cancel{4}$	$^{1}3$	8	2
−	1	8	2	5	0	1
	1	1	1	8	8	1

$$\begin{array}{r} {}^{8}\cancel{9}\ {}^{12}\cancel{3}\ {}^{1}2 \\ -\ 4\ 5\ 7 \\ \hline 4\ 7\ 5 \end{array}$$



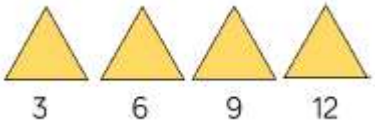
$$\begin{array}{r} {}^{4}\cancel{5}{}^{1}.43 \\ -\ 2.7 \\ \hline 2.73 \end{array}$$

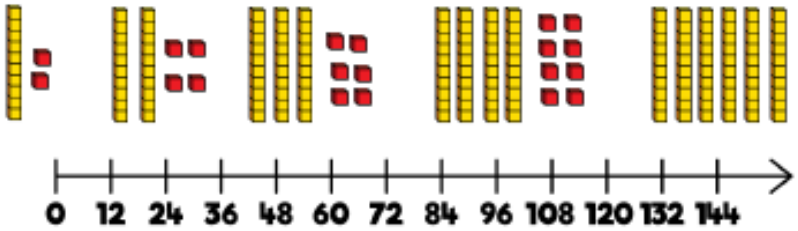
then from the hundreds to the tens column. Next, they can make 2 exchanges in both the hundreds and tens columns and so on. After, it is also important to ensure children are secure in exchanging across columns (800- 235).

Children will draw the answer box and exchange by crossing out then carrying across as shown.

From Year 5, children learn to subtract decimals in contexts using money and measure using the column method (alongside place value counters to start).

Multiplication



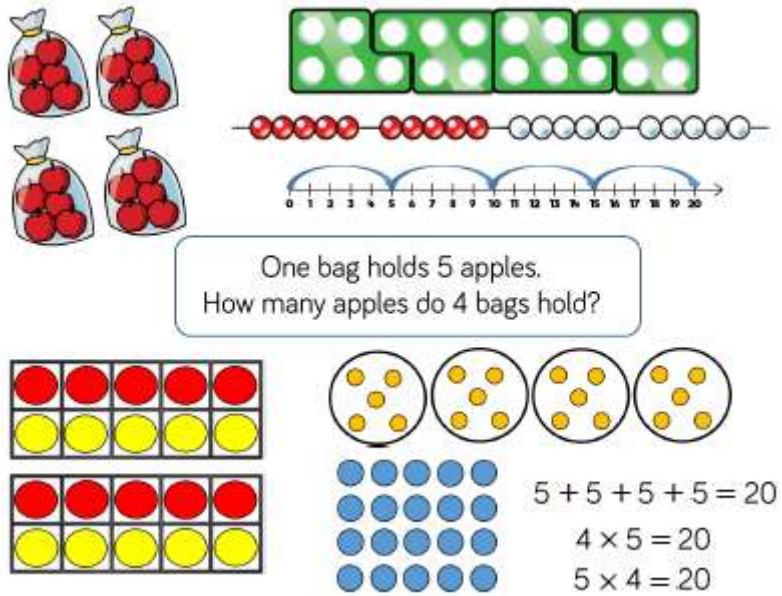


<u>Times tables and corresponding division facts.</u>

Year 1 - (counting in 2,5,10)
Year 2- 2, 5, 10 times tables
Year 3 - 3, 4, 6 and 8 times tables
Year 4 - up to 12 x 12 times tables

Children count in multiples back and forward, including songs and rhymes. (This can be supported using a number square or number line).

Children look for patterns whilst learning these (odd/ even numbers digit patterns) and also making links between them (4 times tables are double 2 times tables etc).



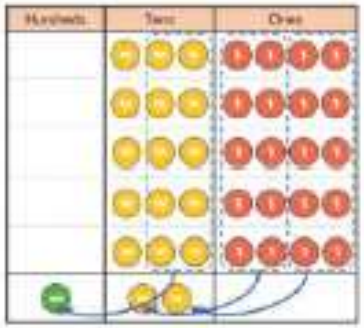
Repeated addition

Children start by looking at multiplication as repeated addition in different ways using concrete and pictorial representations. They also use different representations to solve word problems.

In Year 2 they are introduced to the multiplication symbol.

Expanded Column Method

	H	T	O		
		3	4		
×			5		
		2	0	(5 × 4)	
+	1	5	0	(5 x 30)	
	1	7	0		



Column multiplication

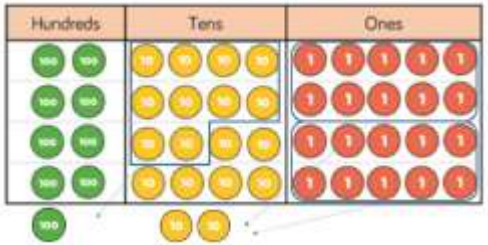
Children use the expanded column method alongside place value counters and base 10 to support their understanding. Also supported by their times table facts.

Short Multiplication

	H	T	O	
		3	4	
×			5	
	1	7	0	
	1	2		

342 × 7 becomes

	3	4	2
×			7
2	3	9	4
	2	1	



	H	T	O
	2	4	5
×			4
	9	8	0
	1	2	

Long Multiplication

Th	H	T	O
	2	3	4
×		3	2
	4	6	8
1 7	1 0	2	0
7	4	8	8

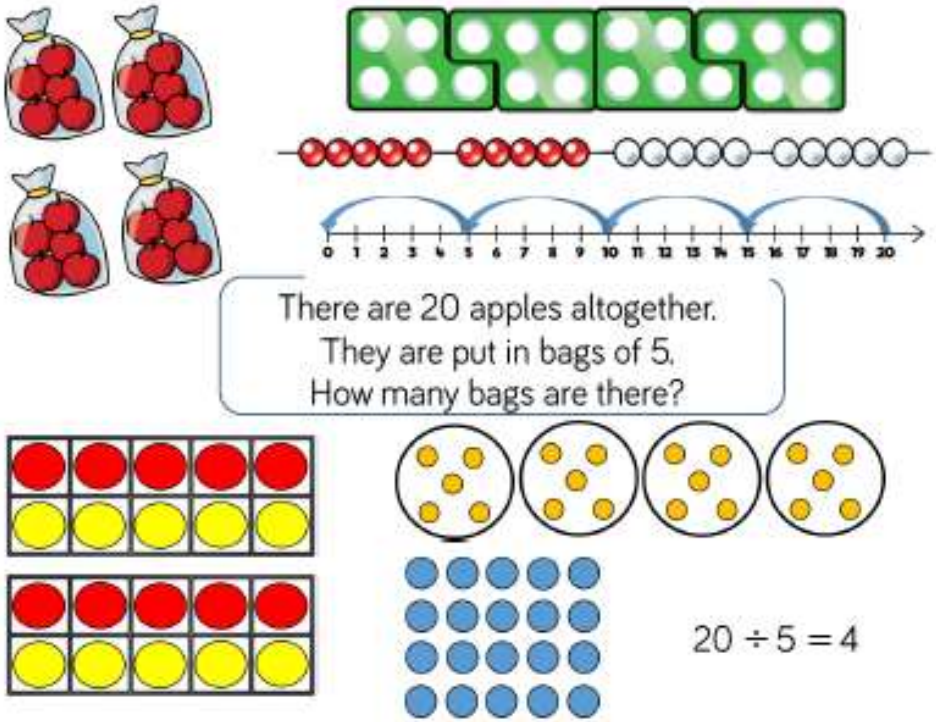
TTh	Th	H	T	O
	2	7	3	9
×			2	8
2 2	1 5	9 3	1 7	2
1 5	4	7 1	8	0
7	6	6	9	2
		1		

Once they understand the concept, children move onto the short multiplication column method, exchanging at the bottom.

In Year 5 children are then introduced to long multiplication method when multiplying 2-digit by 3-digit number. This is then consolidated and secured in Year 6 also.

See written method picture to show exchanging.

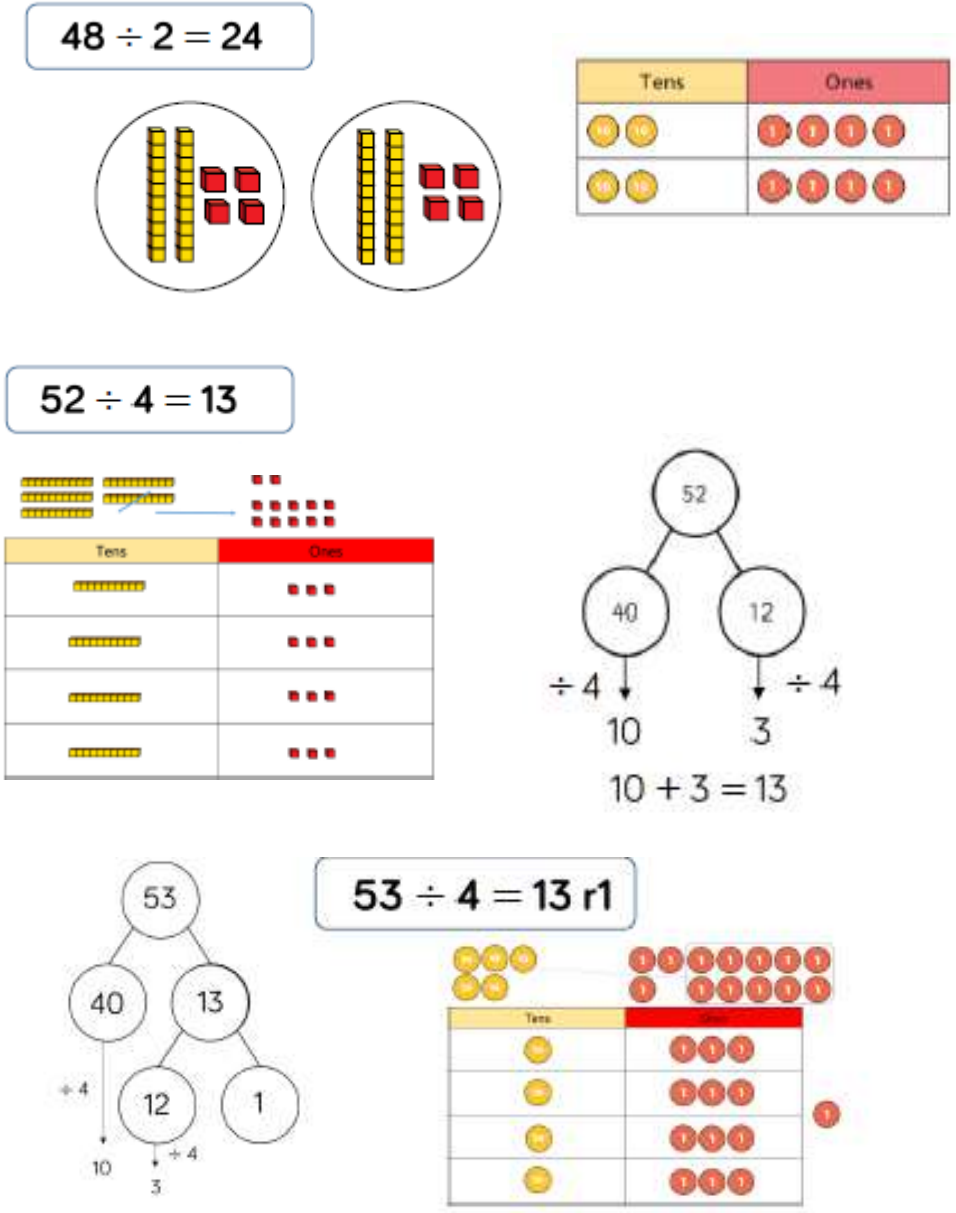
Division



Sharing

Children start by sharing amounts into equal groups. They use concrete and then pictorial representations to solve problems.

In Year 2, children ate introduced to the division symbol.



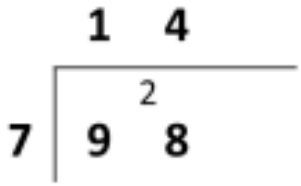
Partition

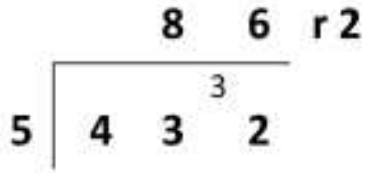
When dividing larger numbers, children use manipulatives that allow them to partition into tens and ones.

In Year 3/ 4 children divide using the part- whole model to help partition the number then use concrete resources and times table facts to divide. Flexible partitioning helps support this method when exchanging.

This then allows them to divide with remainders.

Short division





	4	2	6	6
2	8	5	$^{1}3$	$^{1}2$

$7{,}335 \div 15 = 489$

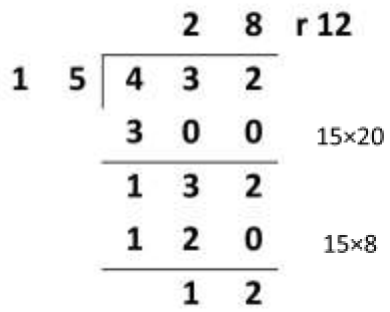
	0	4	8	9
15	7	$^{7}3$	$^{13}3$	$^{13}5$

15	30	45	60	75	90	105	120	135	150

Short division

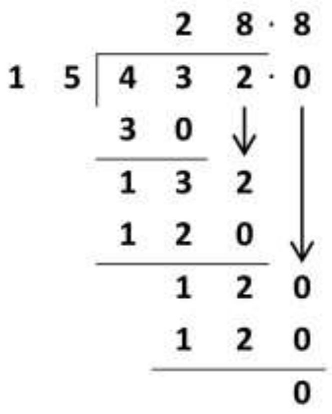
Children use grouping starting with the largest place value and group by the divisor. Remainders will also be used here.

Long division	Long division
432 ÷ 15 becomes	Children can write out the multiples to support their calculations. They use these facts to take away chunks in steps.



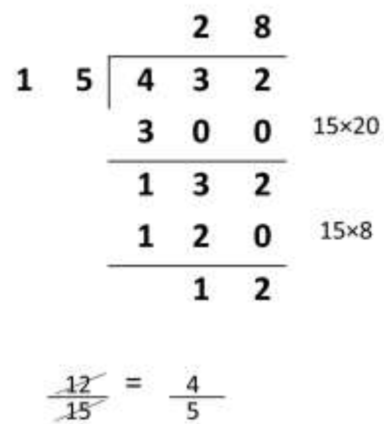
$1 \times 15 = 15$
$2 \times 15 = 30$
$3 \times 15 = 45$
$4 \times 15 = 60$
$5 \times 15 = 75$
$10 \times 15 = 150$

432 ÷ 15 becomes



Answer: 28·8

432 ÷ 15 becomes



Answer: $28 \frac{4}{5}$

Children in year 6 will also convert remainders in to a fraction or decimal where needed.