

# **Sir John Lillie Primary School**



## **Mathematics Calculations Policy**

This policy supports the White Rose maths scheme used throughout the school. Progression within each area of calculation is in line with the programme of study in the 2014 National Curriculum. This calculation policy should be used to support children to develop a deep understanding of number and calculation.

This policy has been taken and adapted from White Rose Maths. It has been designed to teach children through the use of concrete, pictorial and abstract representations.

- Concrete representation— a pupil is first introduced to an idea or skill by acting it out with real objects. This is a ‘hands on’ component using real objects and is a foundation for conceptual understanding.
- Pictorial representation – a pupil has sufficiently understood the ‘hands on’ experiences performed and can now relate them to representations, such as a diagram or picture of the problem.
- Abstract representation—a pupil is now capable of representing problems by using mathematical notation, for example  $12 \times 2 = 24$ . It is important that conceptual understanding, supported by the use of representation, is secure for all procedures. Reinforcement is achieved by going back and forth between these representations.

### Mathematics mastery

At the centre of the mastery approach to the teaching of mathematics is the belief that all children have the potential to succeed. They should have access to the same curriculum content and, rather than being extended with new learning, they should deepen their conceptual understanding by tackling challenging and varied problems. Similarly, with calculation strategies, children must not simply rote learn procedures but demonstrate their understanding of these procedures through the use of concrete materials and pictorial representations. This policy outlines the different calculation strategies that should be taught and used in Year 1 to Year 6 in line with the requirements of the 2014 Primary National Curriculum.

This policy goes through the four operations:

Addition

Subtraction

Multiplication

Division

Each operation is broken down into skills for each year group and shows recommended concrete resources, visual representations and informal and formal written methods.

# Addition

## Concrete resources and images



Use toys and general classroom resources for children to physically manipulate, group/regroup.

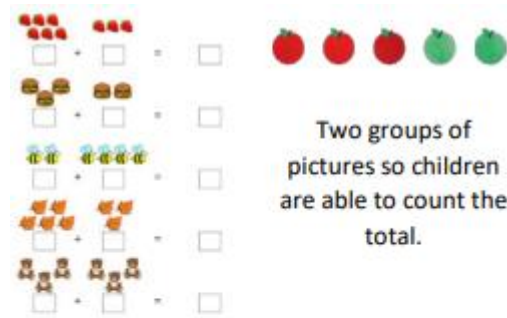


Use specific maths resources such as counters, snap cubes, Numicon etc.

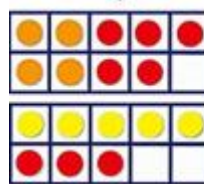


Use visual supports such as ten frames, part whole and addition mats, with the physical objects and resources that can be manipulated.

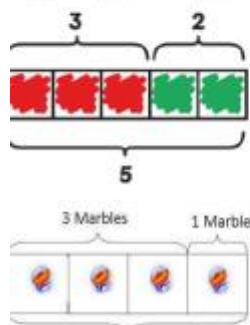
### Pictorial



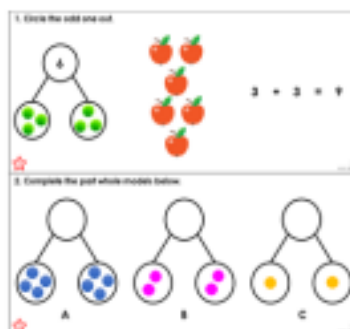
Two groups of pictures so children are able to count the total.



Use visual supports such as ten frames, part part whole and addition mats with pictures/icons.



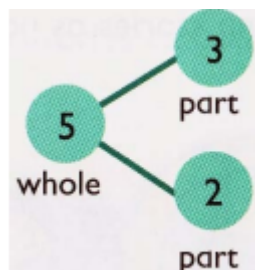
Bar model using visuals, pictures/icons or colours.



### Abstract

$$5 + 2 = 7$$

\* No expectation for children to be able to record a number sentence/addition calculation.



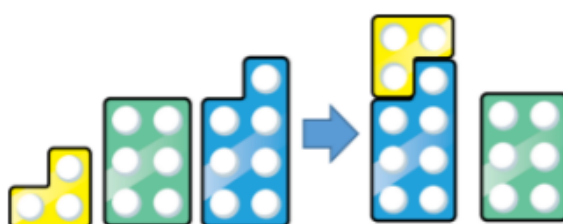
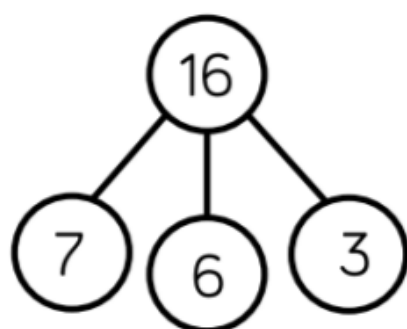
## EYFS

- Knows that a group of things change in quantity when something is added.
- Find the total number of items in two groups by counting all of them.
- Says the number that is one more than a given number.
- Understand the 1 more than/one less than relationship between consecutive numbers.
- In practical activities and discussion, beginning to use the vocabulary involved in adding.
- Using quantities and objects, they add two single digit numbers and count on to find the answer.
- Solve problems including \*doubling.
- Automatically recall number bonds for numbers 0 to 5 including subtraction facts and some number bonds to 10

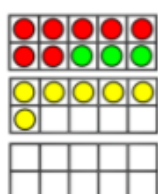
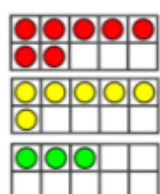


### Skill: Add three 1-digit numbers

Year: 2

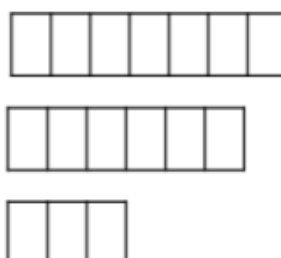


$$7 + 6 + 3 = 16$$



$$7 + 6 + 3 = 16$$

10



16

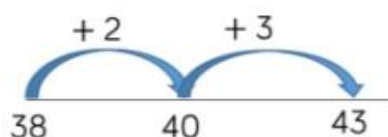
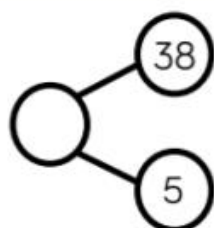
When adding three 1-digit numbers, children should be encouraged to look for number bonds to 10 or doubles to add the numbers more efficiently.

This supports children in their understanding of commutativity.

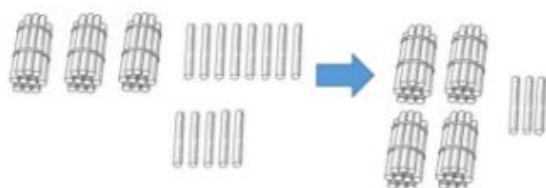
Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers.

### Skill: Add 1-digit and 2-digit numbers to 100

Year: 2/3



$$38 + 5 = 43$$



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
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

When adding single digits to a two-digit number, children should be encouraged to count on from the larger number.

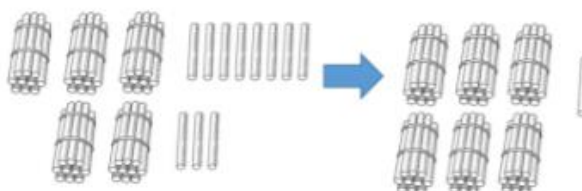
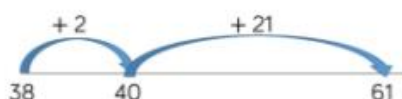
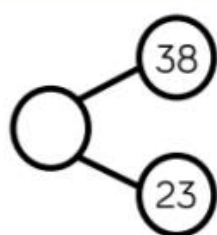
They should also apply their knowledge of number bonds to add more efficiently e.g.  $8 + 5 = 13$  so  $38 + 5 = 43$ .

Hundred squares and straws can support children to find the number bond to 10.



### Skill: Add two 2-digit numbers to 100

Year: 2/3



?	
38	23

$$38 + 23 = 61$$

Tens	Ones

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

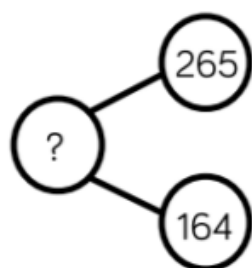
Tens	Ones

At this stage, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.

Children can also use a blank number line to count on to find the total. Encourage them to jump to multiples of 10 to become more efficient.

### Skill: Add numbers with up to 3 digits

Year: 3



?	
265	164

265	}	?
164		

$$265 + 164 = 429$$

Hundreds	Tens	Ones

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

Hundreds	Tens	Ones

Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 3 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

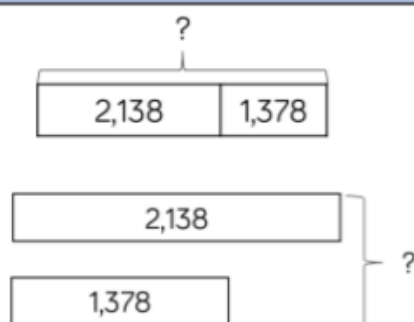
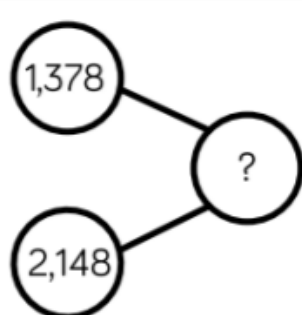
### Skill: Add numbers with up to 4 digits

Year: 4

Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 4 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.



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

$$1,378 + 2,148 = 3,526$$

Thousands	Hundreds	Tens	Ones

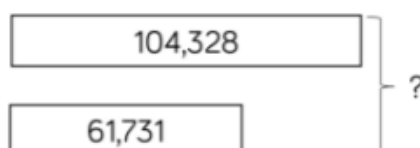
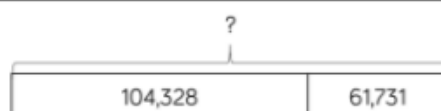
Thousands	Hundreds	Tens	Ones

### Skill: Add numbers with more than 4 digits

Year: 5/6

Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits.

At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently.



$$104,328 + 61,731 = 166,059$$

HTh	TTh	Th	H	T	O

1	0	4	3	2	8
+	6	1	7	3	1
	1	6	6	0	9
				1	

Skill: Add with up to 3 decimal places	Year: 5
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> <div style="text-align: center;"> <math display="block">\begin{array}{r} 3.65 \\ + 2.41 \\ \hline 6.06 \\ 1 \end{array}</math> </div> </div> <div style="text-align: center; margin: 10px 0;"> <math display="block">3.65 + 2.41 = 6.06</math> </div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> </div>	<p>Place value counters and plain counters on a place value grid are the most effective manipulatives when adding decimals with 1, 2 and then 3 decimal places.</p> <p>Ensure children have experience of adding decimals with a variety of decimal places. This includes putting this into context when adding money and other measures.</p>

**Year 6**—add several numbers of increasing complexity Including adding money, measure and decimals with different numbers of decimal places (using 0 as a place holder).

$$\begin{array}{r} 81,059 \\ 3,668 \\ 15,301 \\ + 20,551 \\ \hline 120,579 \end{array}$$

Insert zeros for place holders.

$$\begin{array}{r} 23.361 \\ 9.080 \\ 59.770 \\ + 1.300 \\ \hline 93.511 \\ 212 \end{array}$$

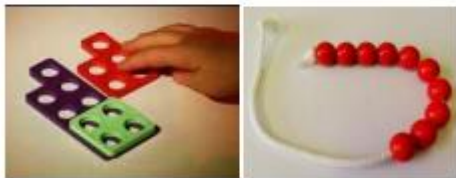


# Subtraction

## Concrete resources and images

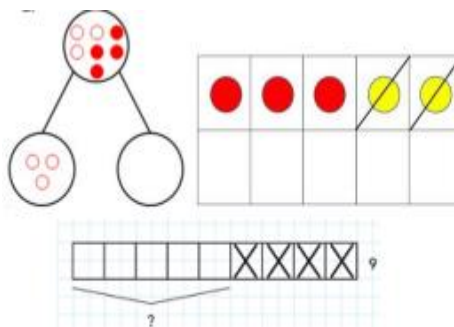
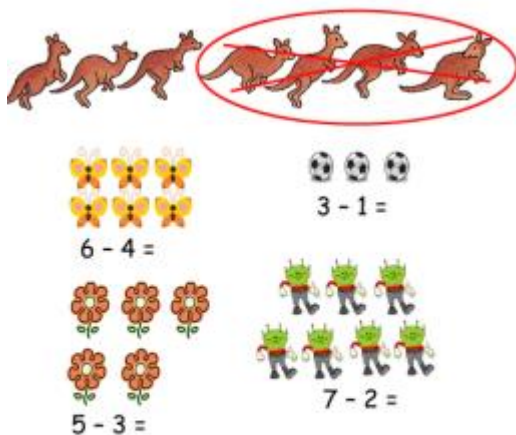


Use toys and general classroom resources for children to physically manipulate, group/regroup.



Use specific maths resources such as snap cubes, Numicon, bead strings etc.

## Pictorial



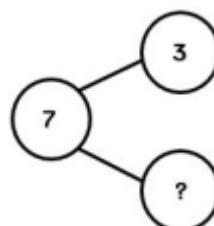
Use visual supports such as ten frames, part part whole and bar model with pictures/icons.

A group of pictures for children to cross out or cover quantities to support subtraction.

## Abstract

$$10 - 6 = 4$$

3	?
7	



## EYFS

- Knows that a group of things change in quantity when something is taken away
- Find one less from a group of five objects, then ten objects.
- In practical activities and discussion, beginning to use the vocabulary involved in subtracting.
- Using quantities and objects, they subtract two single digit numbers and count back to find the answer.

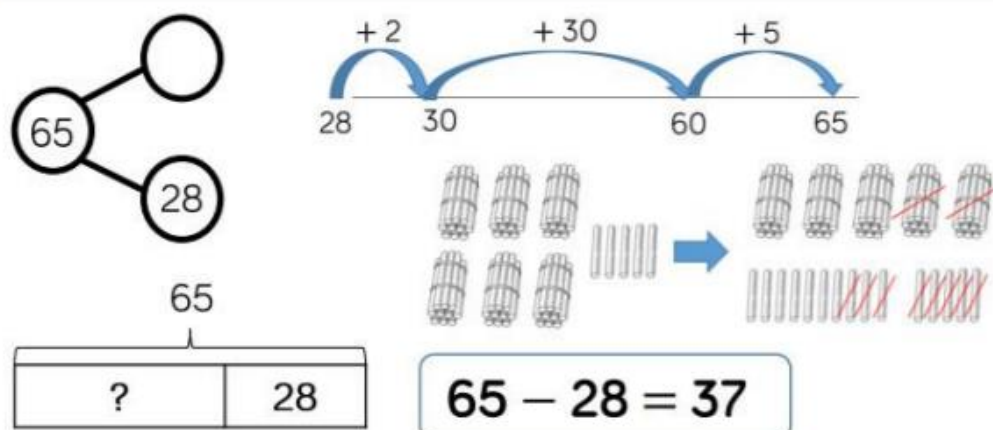
\* No expectation for children to record a number sentence

Skill: Subtract 1-digit numbers within 10	Year: 1
<p><math>7 - 3 = 4</math></p>	<p>Part-whole models, bar models, ten frames and number shapes support partitioning.</p> <p>Ten frames, number tracks, single bar models and bead strings support reduction.</p> <p>Cubes and bar models with two bars can support finding the difference.</p>

Skill: Subtract 1 and 2-digit numbers to 20	Year: 1/2
<p><math>14 - 6 = 8</math></p>	<p>When subtracting one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.</p> <p>Children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, number shapes and number lines are particularly useful for this.</p>

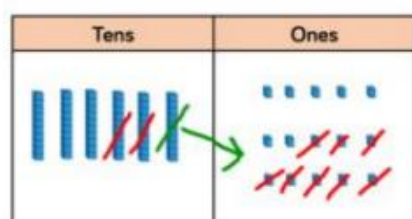
## Skill: Subtract 1 and 2-digit numbers to 100

Year: 2

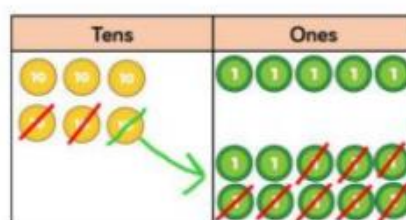


At this stage, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.

Children can also use a blank number line to count on to find the difference. Encourage them to jump to multiples of 10 to become more efficient.

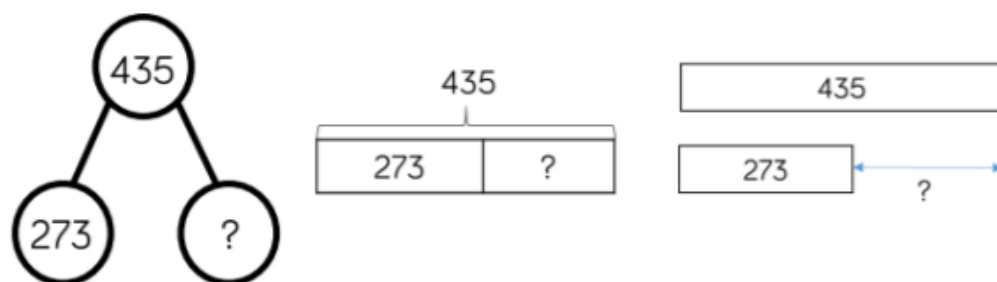


$$\begin{array}{r} 5 \ 1 \\ 65 \\ - 28 \\ \hline 37 \end{array}$$



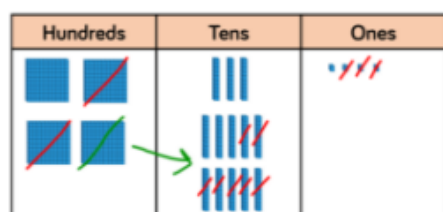
## Skill: Subtract numbers with up to 3 digits

Year: 3

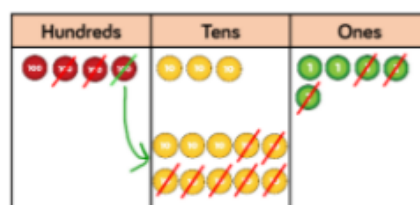


Base 10 and place value counters are the most effective manipulative when subtracting numbers with up to 3 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.



$$\begin{array}{r} 3 \ 1 \\ 435 \\ - 273 \\ \hline 262 \end{array}$$



Plain counters on a place value grid can also be used to support learning.



Skill: Subtract numbers with up to 4 digits

Year: 4

4,357

2,735    ?

4,357

2,735    ?

$$\begin{array}{r} 4357 \\ - 2735 \\ \hline 1622 \end{array}$$

$$4,357 - 2,735 = 1,622$$

Thousands	Hundreds	Tens	Ones

Thousands	Hundreds	Tens	Ones

Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 4 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

Skill: Subtract with up to 3 decimal places

Year: 5

5.43

2.7    ?

5.43

2.7    ?

$$\begin{array}{r} 5.43 \\ - 2.70 \\ \hline 2.73 \end{array}$$

$$5.43 - 2.7 = 2.73$$

Ones	Tenths	Hundredths

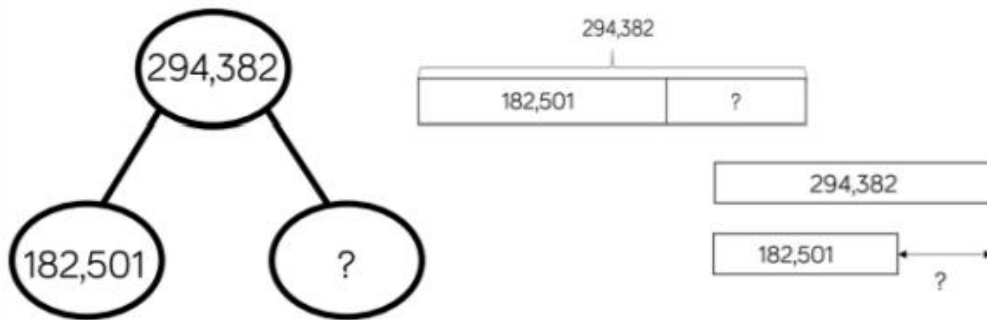
Ones	Tenths	Hundredths

Place value counters and plain counters on a place value grid are the most effective manipulative when subtracting decimals with 1, 2 and then 3 decimal places.

Ensure children have experience of subtracting decimals with a variety of decimal places. This includes putting this into context when subtracting money and other measures.

# Skill: Subtract numbers with more than 4 digits

Year: 5/6



$$294,382 - 182,501 = 111,881$$

HTh	TTh	Th	H	T	O

	2	9	3	1	8	2
-	1	8	2	5	0	1
	1	1	1	8	8	1

Place value counters or plain counters on a place value grid are the most effective concrete resource when subtracting numbers with more than 4 digits.

At this stage, children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently.

**Year 6** using the formal written method to Subtract with increasingly large and more complex numbers and decimal values (up to 3 decimal place)

$$\begin{array}{r} \cancel{X}^{\text{M}} \cancel{8}^{\text{H}} \cancel{0}^{\text{C}}, 699 \\ - \quad 89,949 \\ \hline 60,750 \end{array}$$

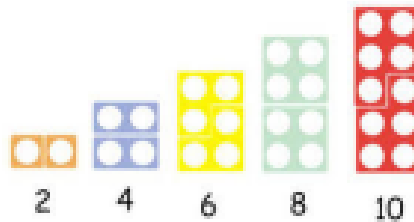
$$\begin{array}{r} \cancel{X}^{\text{M}} \cancel{0}^{\text{H}} 5 \cdot \cancel{X}^{\text{H}} 19 \text{ kg} \\ - \quad 36 \cdot 08 \text{ kg} \\ \hline 69 \cdot 339 \text{ kg} \end{array}$$



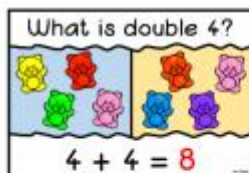
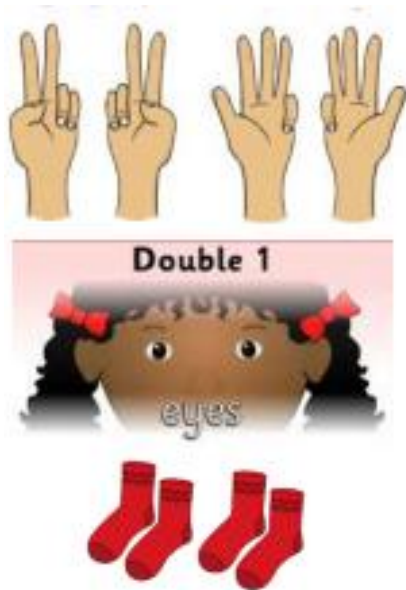
# Multiplication

## Concrete resources and images

Counting and other maths resources for children to make 2 equal groups.



Physical and real life examples that encourage children to see concept of doubling as adding two equal groups.



Pictures and icons that encourage children to see concept of doubling as adding two equal groups.

## EYFS

Solve problems including doubling

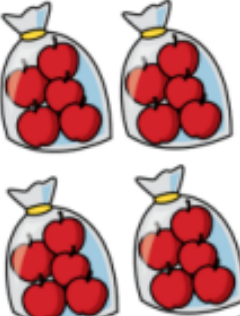



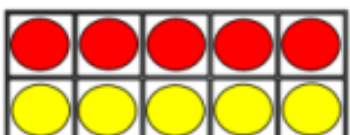
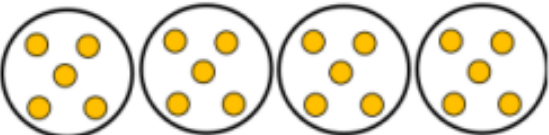

Our calculation policy for multiplication shows a breakdown of times tables; what should be taught when and what that teaching should look like.

During the Summer Term, the children in Year 4 sit the Multiplication Tables Check in line with the Government's assessment framework.

Times tables continue to be recalled and tested throughout Years 5 and 6 with the times tables Olympics.

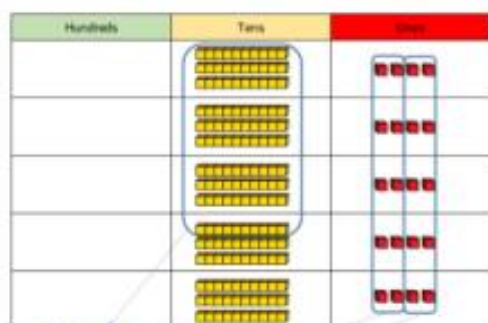
Skill	Year	Representations and models	
Recall and use multiplication and division facts for the 2-times table	2	Bar model Number shapes Counters Money	Ten frames Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 5-times table	2	Bar model Number shapes Counters Money	Ten frames Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 10-times table	2	Hundred square Number shapes Counters Money	Ten frames Bead strings Number lines Base 10
Recall and use multiplication and division facts for the 3-times table	2	Hundred square Number shapes Counters	Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 4-times table	3	Hundred square Number shapes Counters	Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 8-times table	3	Hundred square Number shapes	Bead strings Number tracks Everyday objects
Recall and use multiplication and division facts for the 6-times table	4	Hundred square Number shapes	Bead strings Number tracks Everyday objects

Skill	Year	Representations and models	
Recall and use multiplication and division facts for the 7-times table	4	Hundred square Number shapes	Bead strings Number lines
Recall and use multiplication and division facts for the 9-times table	4	Hundred square Number shapes	Bead strings Number lines
Recall and use multiplication and division facts for the 11-times table	4	Hundred square Base 10	Place value counters Number lines
Recall and use multiplication and division facts for the 12-times table	4	Hundred square Base 10	Place value counters Number lines

Skill: Solve 1-step problems using multiplication	Year: 1/2
    <p>One bag holds 5 apples. How many apples do 4 bags hold?</p>    $5 + 5 + 5 + 5 = 20$ $4 \times 5 = 20$ $5 \times 4 = 20$	<p>Children represent multiplication as repeated addition in many different ways.</p> <p>In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record multiplication formally.</p> <p>In Year 2, children are introduced to the multiplication symbol.</p>

## Skill: Multiply 2-digit numbers by 1-digit numbers

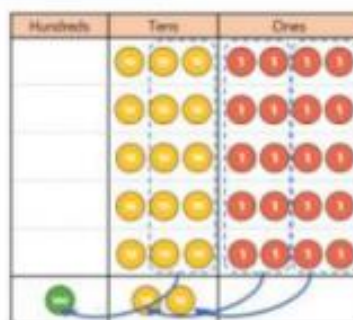
Year: 3/4



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

$$34 \times 5 = 170$$

	H	T	O
		3	4
x			5
	1	7	0



Teachers may decide to first look at the expanded column method before moving on to the short multiplication method.

The place value counters should be used to support the understanding of the method rather than supporting the multiplication, as children should use times table knowledge.

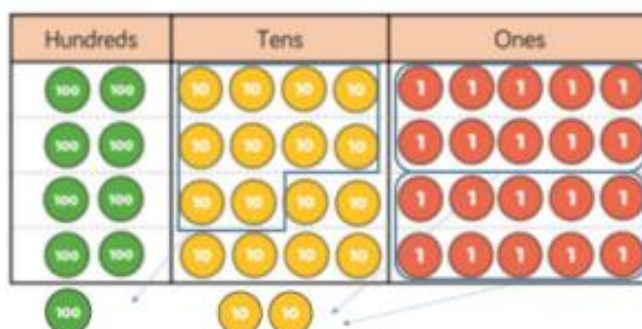
## Skill: Multiply 3-digit numbers by 1-digit numbers

Year: 3/4



	H	T	O
	2	4	5
x			4
	9	8	0

$$245 \times 4 = 980$$



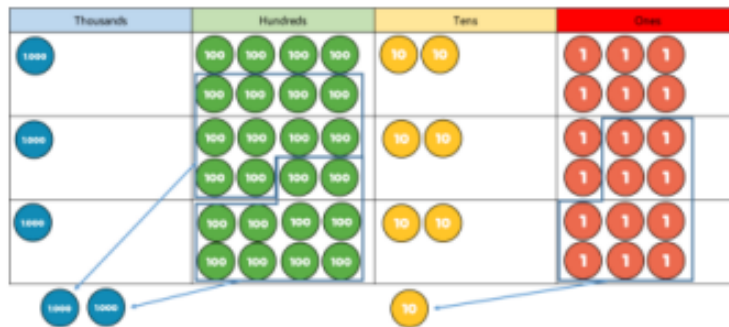
When moving to 3-digit by 1-digit multiplication, encourage children to move towards the short, formal written method.

Base 10 and place value counters continue to support the understanding of the written method. Limit the number of exchanges needed in the questions and move children away from resources when multiplying larger numbers.



## Skill: Multiply 4-digit numbers by 1-digit numbers

Year: 5



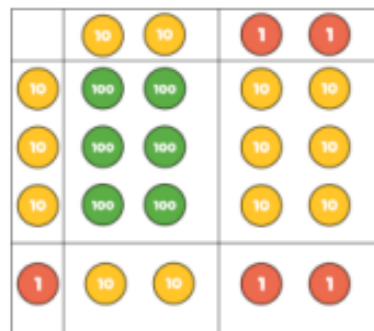
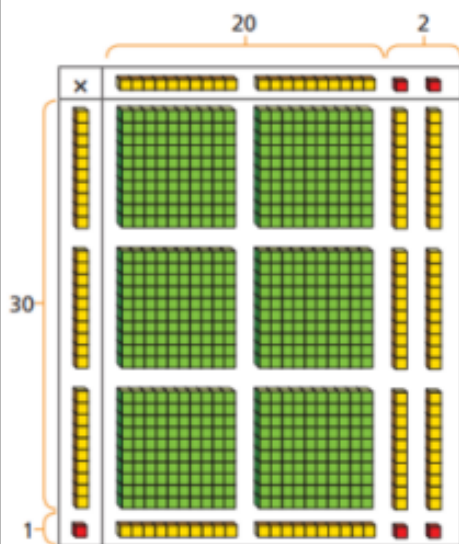
$$1,826 \times 3 = 5,478$$

	Th	H	T	O
	1	8	2	6
x				3
	5	4	7	8
	2		1	

When multiplying 4-digit numbers, place value counters are the best manipulative to use to support children in their understanding of the formal written method. If children are multiplying larger numbers and struggling with their times tables, encourage the use of multiplication grids so children can focus on the use of the written method.

## Skill: Multiply 2-digit numbers by 2-digit numbers

Year: 5



x	20	2
30	600	60
1	20	2

	H	T	O
		2	2
x		3	1
		2	2
	6	6	0
	6	8	2

$$22 \times 31 = 682$$

When multiplying a multi-digit number by 2-digits, use the area model to help children understand the size of the numbers they are using. This links to finding the area of a rectangle by finding the space covered by the Base 10. The grid method matches the area model as an initial written method before moving on to the formal written multiplication method.

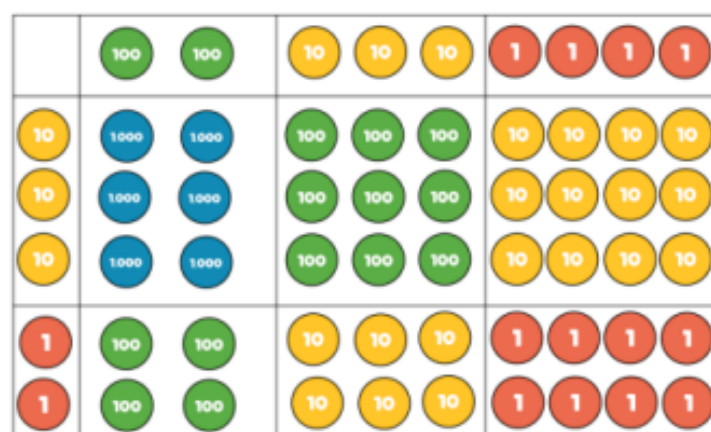


The turtle head video can be used to support the formal written method.



# Skill: Multiply 3-digit numbers by 2-digit numbers

Year: 5



Th	H	T	O
	2	3	4
×		3	2
	4	6	8
17	10	2	0
7	4	8	8

×	200	30	4
30	6,000	900	120
2	400	60	8

$$234 \times 32 = 7,488$$

Children can continue to use the area model when multiplying 3-digits by 2-digits. Place value counters become more efficient to use but Base 10 can be used to highlight the size of numbers.

Encourage children to move towards the formal written method, seeing the links with the grid method.

# Skill: Multiply 4-digit numbers by 2-digit numbers

Year: 5/6

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

1

$$2,739 \times 28 = 76,692$$

When multiplying 4-digits by 2-digits, children should be confident in the written method.

If they are still struggling with times tables, provide multiplication grids to support when they are focusing on the use of the method.

Consider where exchanged digits are placed and make sure this is consistent.

# Division

## Concrete resources and images

## EYFS

Children have the opportunity to physically cut objects, food or shapes in half.

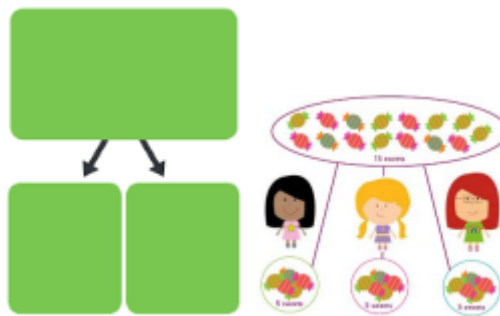
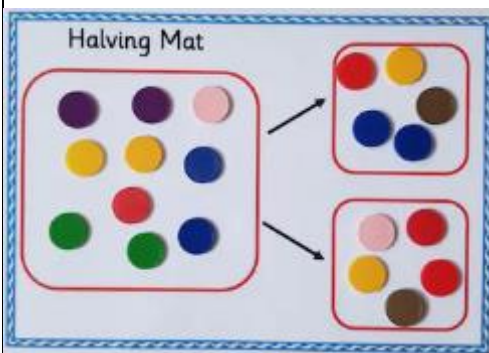


Solve problems including halving and sharing

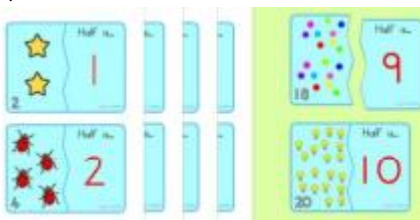
Share quantities using practical resources, role play, stories and songs



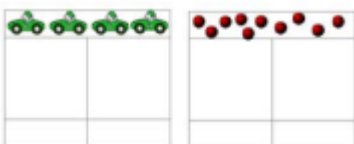
Use visual supports such as halving mats and part part whole, with the physical objects and resources that can be manipulated

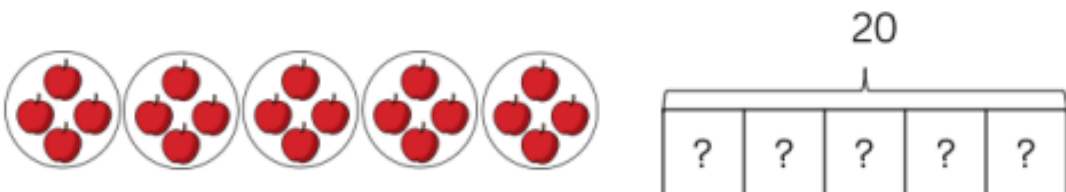
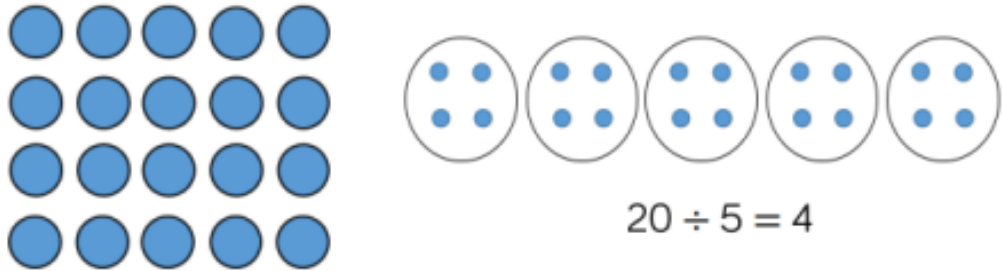





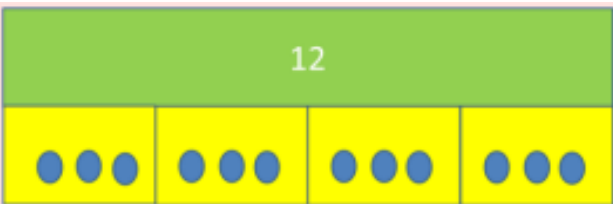
Pictures and icons that encourage children to see concept of halving in relation to subitising, addition and subtraction knowledge. i.e. Knowing 4 is made of 2 groups of 2, so half of 4 is 2.



Bar model with pictures or icons to support understanding of finding 2 equal parts of a number, to further understand how two halves make a whole.

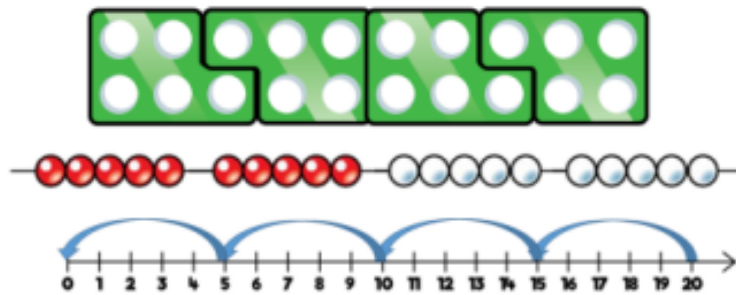
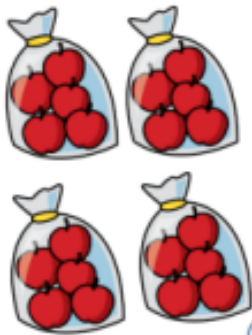


Skill: Solve 1-step problems using multiplication (sharing)	Year: 1/2
 <div data-bbox="319 504 989 672" style="border: 1px solid black; padding: 10px; margin: 20px auto; width: fit-content;"> <p>There are 20 apples altogether. They are shared equally between 5 bags. How many apples are in each bag?</p> </div>  <p style="text-align: center;"><math>20 \div 5 = 4</math></p>	<p>Children solve problems by sharing amounts into equal groups.</p> <p>In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally.</p> <p>In Year 2, children are introduced to the division symbol.</p>

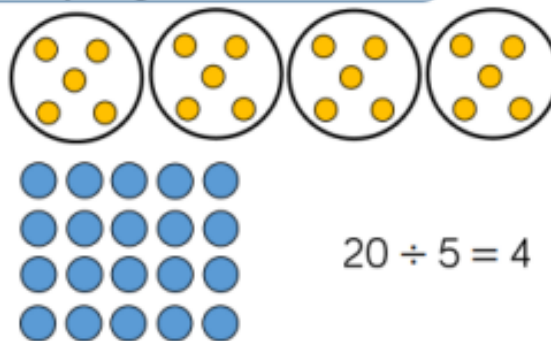
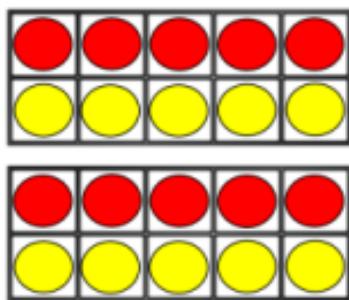
   	<p><b>Year 1</b> Understand division as <b>sharing</b> using concrete resources.</p> <p>Pictorial representation of sharing <b>12 gold coins</b> between 2, 3 and 4 pirates</p> <p><b>Year 2</b> Sharing between 3 using the division symbol.</p> <p>Children use bar modelling to show and support understanding.</p>
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# Skill: Solve 1-step problems using division (grouping)

Year: 1/2



There are 20 apples altogether.  
They are put in bags of 5.  
How many bags are there?

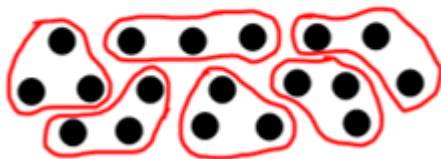


$$20 \div 5 = 4$$

Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line. They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.



18 into groups of 3  
 $18 \div 3 = 6$



$$18 \div 3 = 6$$

18 into groups of 3 = 6 groups  
18 into jumps of 3 = 6 jumps  
 $18 \div 3 = 6$

## Year 1

Begin to understand as grouping using concrete resources

## Year 2

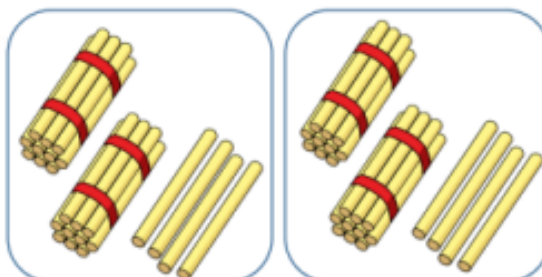
Use concrete resources to group and use the division symbol



# Skill: Divide 2-digits by 1-digit (sharing with no exchange)

Year: 1/2

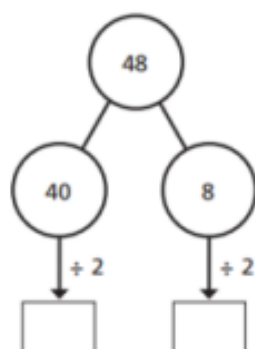
Tens	Ones
10 10	1 1 1 1
10 10	1 1 1 1



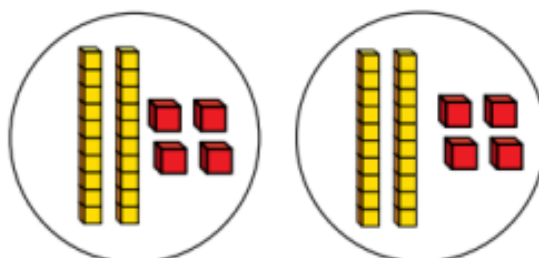
When dividing larger numbers, children can use manipulatives that allow them to partition into tens and ones.

Straws, Base 10 and place value counters can all be used to share numbers into equal groups.

Part-whole models can provide children with a clear written method that matches the concrete representation.



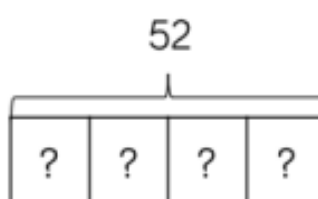
$$48 \div 2 = 24$$



# Skill: Divide 2-digits by 1-digit (sharing with exchange)

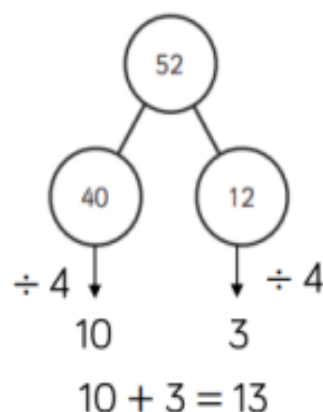
Year: 3/4

Tens	Ones
10 10 10 10	2 2 2 2 2 2 2 2
10 10 10 10	2 2 2 2 2 2 2 2
10 10 10 10	2 2 2 2 2 2 2 2
10 10 10 10	2 2 2 2 2 2 2 2



When dividing numbers involving an exchange, children can use Base 10 and place value counters to exchange one ten for ten ones. Children should start with the equipment outside the place value grid before sharing the tens and ones equally between the rows.

Flexible partitioning in a part-whole model supports this method.



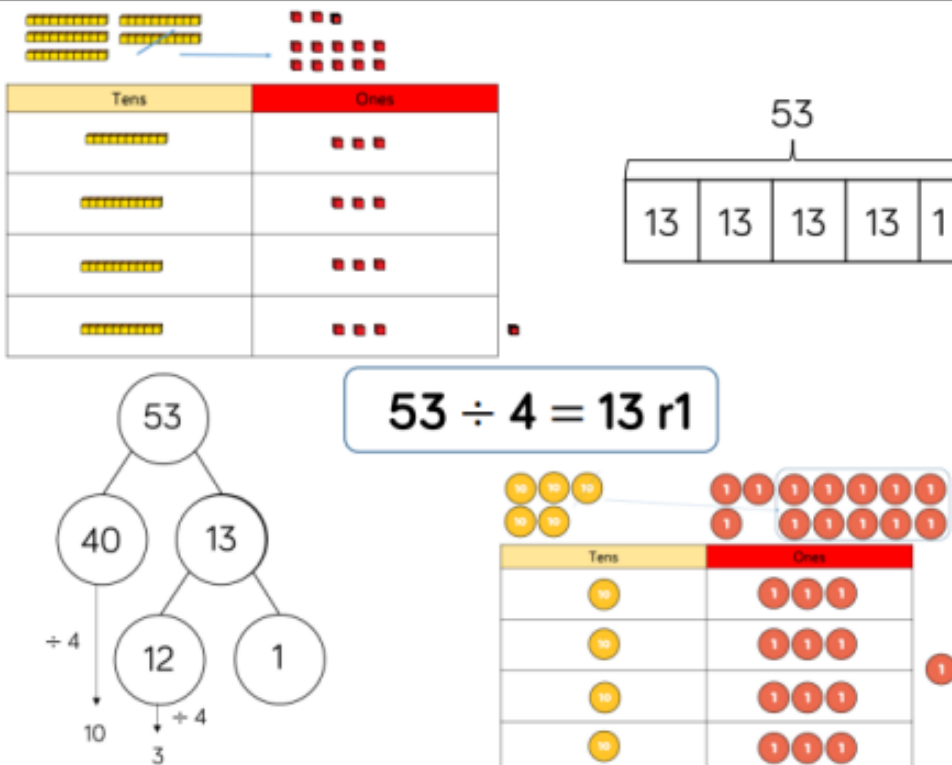
$$52 \div 4 = 13$$

Tens	Ones
10 10 10 10	2 2 2 2 2 2 2 2
10 10 10 10	2 2 2 2 2 2 2 2
10 10 10 10	2 2 2 2 2 2 2 2
10 10 10 10	2 2 2 2 2 2 2 2



### Skill: Divide 2-digits by 1-digit (sharing with remainders)

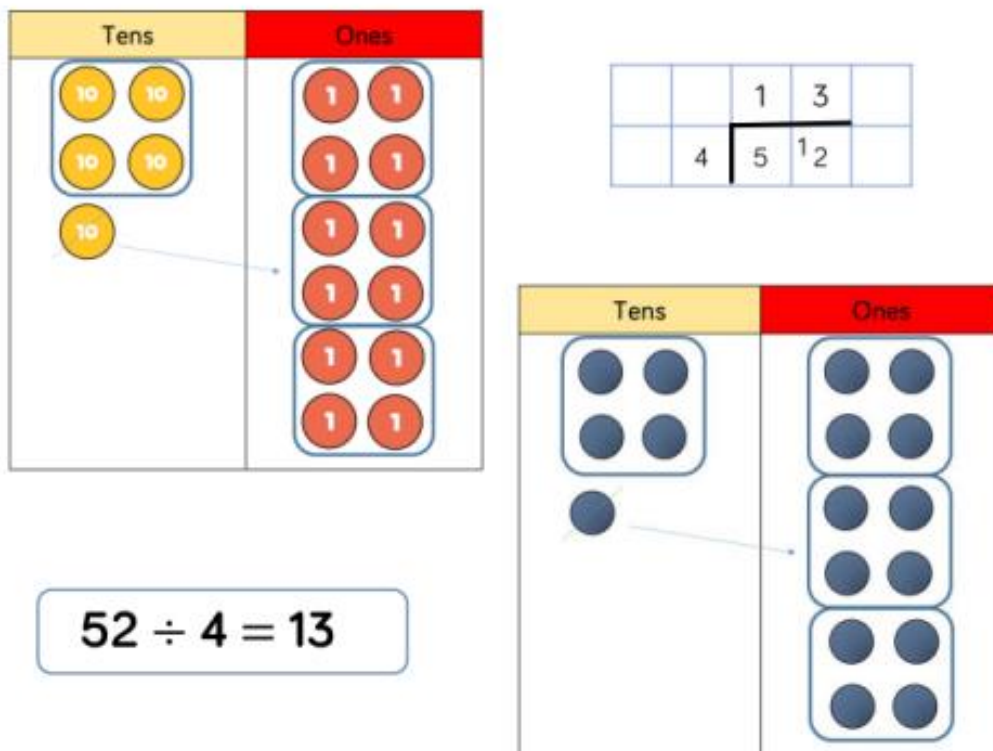
Year: 3/4



When dividing numbers with remainders, children can use Base 10 and place value counters to exchange one ten for ten ones. Starting with the equipment outside the place value grid will highlight remainders, as they will be left outside the grid once the equal groups have been made. Flexible partitioning in a part-whole model supports this method.

### Skill: Divide 2-digits by 1-digit (grouping)

Year: 4/5



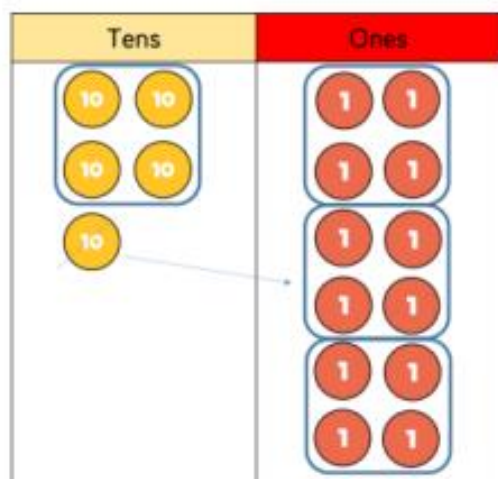
When using the short division method, children use grouping. Starting with the largest place value, they group by the divisor.

Language is important here. Children should consider 'How many groups of 4 tens can we make?' and 'How many groups of 4 ones can we make?'

Remainders can also be seen as they are left ungrouped.

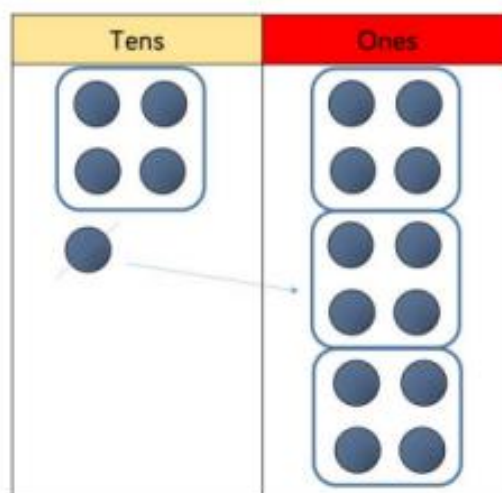
## Skill: Divide 2-digits by 1-digit (grouping)

Year: 4/5



		1	3	
	4	5	12	

$$52 \div 4 = 13$$



When using the short division method, children use grouping. Starting with the largest place value, they group by the divisor.

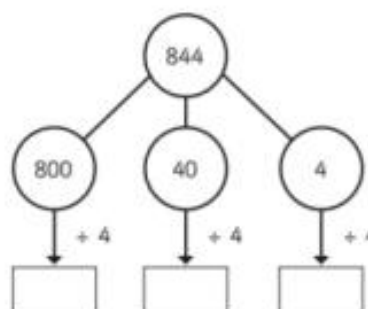
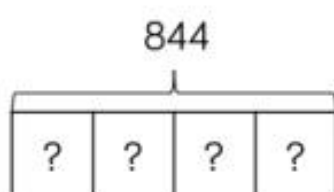
Language is important here. Children should consider 'How many groups of 4 tens can we make?' and 'How many groups of 4 ones can we make?'

Remainders can also be seen as they are left ungrouped.

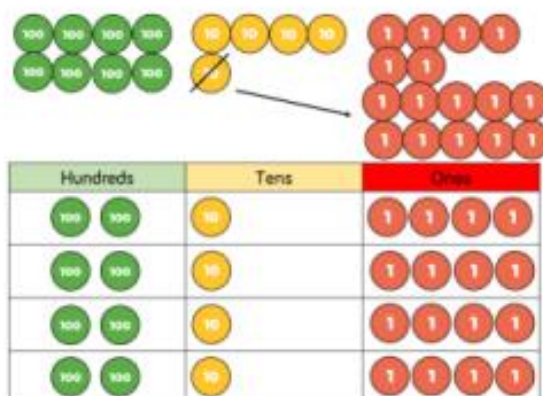
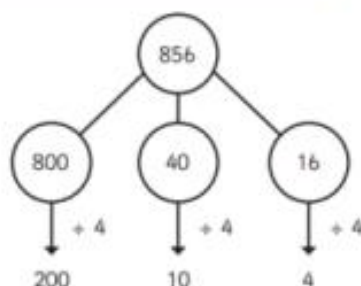
## Skill: Divide 3-digits by 1-digit (sharing)

Year: 4

$$844 \div 4 = 211$$



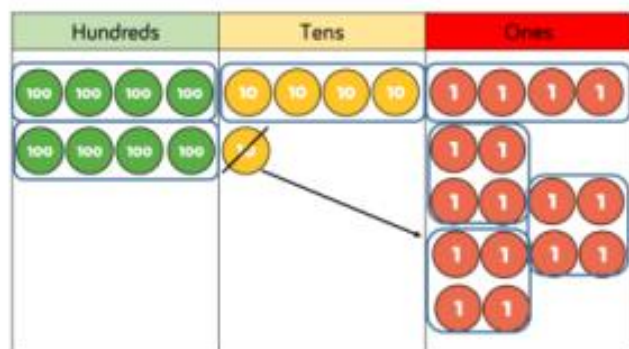
$$844 \div 4 = 211$$



Children can continue to use place value counters to share 3-digit numbers into equal groups. Children should start with the equipment outside the place value grid before sharing the hundreds, tens and ones equally between the rows. This method can also help to highlight remainders. Flexible partitioning in a part-whole model supports this method.

### Skill: Divide 3-digits by 1-digit (grouping)

Year: 5

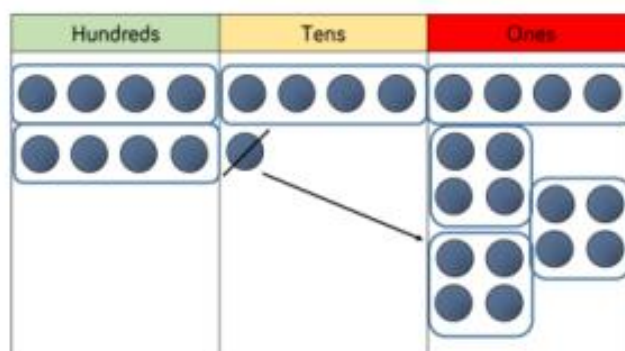


		2	1	4
	4	8	5	16

Children can continue to use grouping to support their understanding of short division when dividing a 3-digit number by a 1-digit number.

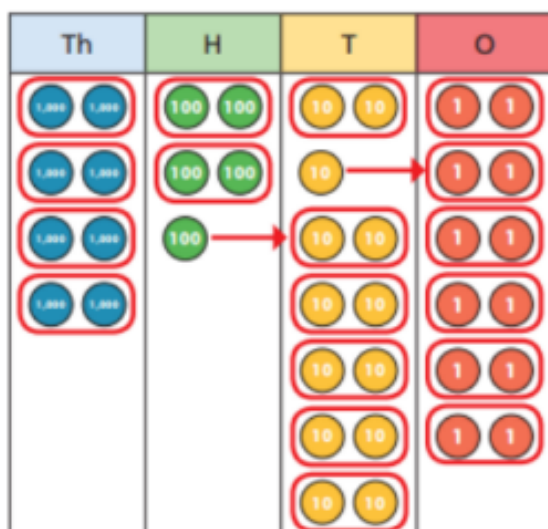
Place value counters or plain counters can be used on a place value grid to support this understanding. Children can also draw their own counters and group them through a more pictorial method.

$$856 \div 4 = 214$$



### Skill: Divide 4-digits by 1-digit (grouping)

Year: 5



	4	2	6	6
2	8	5	13	12

Place value counters or plain counters can be used on a place value grid to support children to divide 4-digits by 1-digit. Children can also draw their own counters and group them through a more pictorial method.

Children should be encouraged to move away from the concrete and pictorial when dividing numbers with multiple exchanges.

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



Skill: Divide multi digits by 2-digits (short division)

Year: 6

		0	3	6
	12	4	<sup>4</sup> 3	<sup>7</sup> 2

$432 \div 12 = 36$

$7,335 \div 15 = 489$

	0	4	8	9
15	7	<sup>7</sup> 3	<sup>13</sup> 3	<sup>13</sup> 5

15	30	45	60	75	90	105	120	135	150
----	----	----	----	----	----	-----	-----	-----	-----

When children begin to divide up to 4-digits by 2-digits, written methods become the most accurate as concrete and pictorial representations become less effective. Children can write out multiples to support their calculations with larger remainders. Children will also solve problems with remainders where the quotient can be rounded as appropriate.

Skill: Divide multi-digits by 2-digits (long division)

Year: 6

		0	3	6
1	2	4	3	2
	-	3	6	0
			7	2
	-		7	2
				0

- (x30)
- (x6)
- 12 x 1 = 12
  - 12 x 2 = 24
  - 12 x 3 = 36
  - 12 x 4 = 48
  - 12 x 5 = 60
  - 12 x 6 = 72
  - 12 x 7 = 84
  - 12 x 8 = 96
  - 12 x 7 = 108
  - 12 x 10 = 120

$432 \div 12 = 36$

$7,335 \div 15 = 489$

	0	4	8	9
15	7	3	3	5
-	6	0	0	0
	1	3	3	5
-	1	2	0	0
		1	3	5
-		1	3	5
				0

- (x400)
- (x80)
- (x9)
- 1 x 15 = 15
  - 2 x 15 = 30
  - 3 x 15 = 45
  - 4 x 15 = 60
  - 5 x 15 = 75
  - 10 x 15 = 150

Children can also divide by 2-digit numbers using long division.

Children can write out multiples to support their calculations with larger remainders.

Children will also solve problems with remainders where the quotient can be rounded as appropriate.



# Skill: Divide multi digits by 2-digits (long division)

Year: 6

$$372 \div 15 = 24 \text{ r}12$$

			2	4	r	1	2
1	5	3	7	2			
	-	3	0	0			
			7	2			
	-		6	0			
			1	2			

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

When a remainder is left at the end of a calculation, children can either leave it as a remainder or convert it to a fraction. This will depend on the context of the question.

Children can also answer questions where the quotient needs to be rounded according to the context.

			2	4	$\frac{4}{5}$
1	5	3	7	2	
	-	3	0	0	
			7	2	
	-		6	0	
			1	2	

$$372 \div 15 = 24 \frac{4}{5}$$