# The Rookeries Calculation Policy



The emphasis throughout school, but especially at KS1, is on visual, auditory and kinaesthetic (concrete) approaches before moving on to more abstract strategies using informal methods and jottings. Addition would be taught as combining two sets (or more) by counting on.

## Expected at the end of Foundation Stage

Children are encouraged to develop a mental picture of the number system in their heads to use for calculation. They develop ways of recording calculations using pictures, etc



**Count all: 3 + 5** Count out three counters **Count on from the first number:** Put the first

and then five counters and then find the total number, 3, in your head and then count on 5 more.

by counting all the counters.





**Number lines:** Children use number lines and practical resources to support answering calculations and the teachers *demonstrate* the use of the number line. Children then begin to use number lines to support their own calculations to count on in ones.

3 + 5 Start at 3 and count on 5. The number you finish on is the answer. 1 2 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

# Expected at the end of Year 1

Count on from the larger number: Understand that addition can be done in any order.

Building on the methods taught in Foundation Stage the children will use fingers and a number line to find the answer.





**Using a hundred square:** In Year 1 children begin to use a hundred square and become more confident with larger numbers and the number system. Using a hundred square the children can add 1s as they do using a number line. A hundred square is also ideal when adding ten to a number.

32 + 7 = 39

50

60

70

80

90

1 2 3 4 5 6 7 8 9 10

41 42 43 44 45 46 47 48 49

51 52 53 54 55 56 57 58 59

61 62 63 64 65 66 67 68 69

71 72 73 74 75 76 77 78 79

81 82 83 84 85 86 87 88 89

91 92 93 94 95 96 97 98 99 100

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

## Expected at the end of Year 2

Using a hundred square to add two two—digit numbers: Once the children are confident with partitioning numbers they are then taught to add two two-digit numbers and this would firstly be taught using a hundred square.

35 + 23 =

35 + 20 + 3 = 58



# Expected at the end of Year 2 continued

Addition in columns for preparation of formal written methods: This is taught by partitioning the numbers and recording in columns so place value is supported and this prepares for the formal written methods in Year 3. To begin with this is taught practically using Base Ten Dienes to add ones first and then add tens.



2	2	+	4	6	=							
						Т			0			
						2	0	+	2			
						4	0	+	6			
						6	0	+	8	=	6	8

## Expected at the end of Year 3

**Formal written method of column addition:** It is expected at the end of Year 3 children will be able to add with up to three digits, using formal written methods using column addition. This is taught practically at first to embed the understanding of place value. Then it is taught practically along side recording in a formal written method. First, we start with adding two two-digit numbers.







## Script:

Remember to always write T and O above the correct column. <u>Always</u> add the ones first. The + sign goes at the left hand side alongside the bottom number. **Adding ones:** 5 + 7 =12. We can't put the 12 in the ones column because 5 + 7 is more than 10. So, we **take** the 10 out and **give** it to the tens (put a little 1 underneath the 10s column– Remember this in 1 ten). So the 2 ones are left which can go in the ones column between the equal lines.

Adding tens: Remind the children they are now dealing with the tens. So we have 20 + 40 plus 1 more 10 which equals 70. How many tens is that? 7 tens. So 7 goes in the answer box between the equal lines.

# Expected at the end of Year 3 continued

**Formal written method of column addition:** At the end of Year 3 it is expected the children will be able to add numbers up to three digits, using formal written methods of column addition, again this will be taught practically first.



	Н	Т	0	
	4	2	9	
+	1	4	3	
	5	7	2	
		1		

## Script:

Remember to always write H, T and O above the correct column. <u>Always</u> add the ones first. The + sign goes at the left hand side alongside the bottom number. **Adding ones:** 9 + 3 =12. I can't put the 12 in the ones column because 9 + 3 is more than 10. So, we **take** the 10 out and **give** it to the tens. I write this under the equal lines in the tens column to add later. So 2 ones are left which can go in the ones column. Write this between the two equal lines.

Adding tens: Remind the children they are now dealing with the tens. I have 20 + 40 plus 1 more 10 which equals 70. How many tens is that? 7 tens. So 7 goes in the answer box, in the tens column, between the two equal lines.

**Adding hundreds:** Remind the children they are now dealing with the hundreds. I have 400 + 100 which equals 500. How many hundreds is that? 5 hundreds so 5 goes in the answer box. In the hundreds column, between the two equals lines.

# Expected at the end of Year 4

**Formal written method of column addition:** In Year 4 it is expected the children will be able to add up to 4 digits using the formal written methods of column addition. This will build on the progress made in Year 3 and if needed it would still be taught practically.



**Script:** Remember to always write Th, H, T and O above the correct column. <u>Always</u> add the ones first. The + sign goes at the left hand side alongside the bottom number.

Same as previous for adding T and O.

Adding hundreds: Remind the children they are now dealing with the hundreds. So, 600 + 500 plus one more hundred which equals 1200. How many hundreds is that? 12 hundreds so because it's larger than 10 hundreds we **take** the 1000 out and **give** it to the thousands. I put the 1 thousand underneath the answer box in the thousand column. So the 2 hundreds which are left can go in the answer box, in the hundreds column, between the equal lines. Adding thousands: Remind the children they are dealing with the thousands. So, 2000 + 2000 plus one more thousand

with the thousands. So, 3000 + 2000 plus one more thousand which equals 6000. How many thousands is that? 6 thousands so 6 goes in the answer box, in the thousands column, between the equal lines.

# Expected at the end of Year 5

**Formal written method of column addition:** At the end of Year 5 it is expected the children will be able to add whole numbers with more than 4 digits, using formal written methods.

	Tth	Th	Н	т	0	
	2	6	4	2	٩	
+	1	0	8	4	3	
	3	7	2	7	2	
		1		1		

**Formal written method of column addition:** Once the children are confident with these written methods they will be taught how to use this column method with decimals, including money. Again, where needed, this would be taught practically first.





Script: This is just the same as the examples above. You still start adding the digits in the right hand column, in this case the hundredths. Notice how again the columns have been labelled to support with place value.

# Expected at the end of Year 6

It is expected by Year 6 children should be able to use the formal written methods of column addition so an emphasis is placed on using and applying these methods to solve problems.

Other examples of how the column method may be used:





# Subtraction -

The emphasis throughout school, but especially at KS1, is on visual, auditory and kinaesthetic (concrete) approaches before moving on to more abstract strategies using informal methods and jottings. Subtraction may be taught as 'take away' or by 'finding the difference'

# Expected at the end of Foundation Stage

Children are encouraged to develop a mental picture of the number system in their heads to use for calculation. They develop ways of recording calculations using pictures etc.



Unlike addition, subtraction cannot be done in any order (18 - 7 is not the same as 7 - 18). Usually the largest number must come first.



# — Subtraction —

# Expected at the end of Year 2

**Using a hundred square to subtract two two—digit numbers:** Once the children are confident with partitioning numbers they are then taught to subtract two two-digit numbers and this would firstly be taught using a hundred square by partitioning the number into tens and ones.

54-22 = 32

First, start at the largest number (54)

and take away the tens building on the

work in Year 1. Then take away the ones.

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

Subtraction in columns for preparation of formal written methods: This is taught by recording in columns so place value is supported and this prepares for the formal written methods taught in Year 3. To begin with this is taught practically using Base Ten Dienes to subtract ones first and then subtract tens.

This line must be kept empty under the T and U labels.



Once children have shown understanding of presenting their work using a column method they may be taught the vertical subtraction formal written method as in Year 3. They would firstly be taught to subtract two two—digit numbers as in Year 3. See the next page for an example.

# — Subtraction -

## Expected at the end of Year 3

**Formal written method of column subtraction:** This is taught practically at first to embed the understanding of place value. Then it is taught practically along side recording in a formal written method. At the end of Year 3 it is expected the children will be able to subtract numbers up to three digits, using formal written methods of column subtraction. First, we start with subtracting two two-digit numbers.



#### Script:

Remember to always write T and O above the correct column. <u>Always</u> subtract the ones first. The - sign goes at the left hand side alongside the bottom number.

Subtracting the ones: 2-7 = I have 2 and I want to take away 7. I can't do this (unless I'm working with negative numbers) so I need to take a 10 from the tens and give it to the ones. I cross out the tens and write the new number above the tens. So I now have 6 tens. Write the 1 ten above, and to the left of the 2 ones, so the calculation is now I have 12 and I want to take away 7. I can do this calculation and the answer is 5. I write this under the ones column between the equals lines.

Subtracting the tens: 60-40 = . I have 60 and I want to take away 40. This I can do and the answer is 20. So I have 2 tens and I write the 2 under the tens column between the equals lines.

Formal written method of column subtraction: At the end of Year 3 it is expected children will subtract numbers up to three digits, using formal written methods of column subtraction, again this will be taught practically first.

	Н	Т	0	
		7	1	
	5	<b>8</b>	2	
-	3	4	7	
	2	3	5	

#### Script:

**Remember:** Always write H, T and O above the correct column. <u>Always</u> subtract the ones first. The - sign goes at the left hand side alongside the bottom number.

**Subtracting the ones:** 2—7 = I have 2 and I want to take away 7. I can't do this (unless I'm working with negative numbers) so I need to **take** a 10 from the tens and **give** it to the ones. I cross out the tens and write the new number above the tens. I now have 7 tens. Write the 1 ten above, and to the left of the 2 ones so the calculation is now I have 12 and I want to take away 7. I can do this calculation and the answer is 5. I write this under the ones column between the equals lines.

Subtracting the tens: 70-40 = . | have 70 and | want to take away 40. This | can do and the answer is 30. So | have 3 tens and | write the 3 under the tens column between the equals lines.

Subtracting the hundreds: 500-300 =. I have 500 and I want to take away 300. This I can do and the answer is 200. So I have 2 hundreds so I write the 2 under the hundreds column between the equals line.

# - Subtraction

## Expected at the end of Year 4

**Formal written method of column subtraction:** In Year 4 it is expected the children will subtract up to 4 digits using the formal written methods of column subtraction. This would be built on the progress made in Year 3 and if needed it would still be taught practically.

Th	Η	Т	0	
3 /	1	6/	1	
4	2	7	3	
1	6	4	5	
2	6	2	8	

#### Script:

**Remember:** Always write Th, H, T and O above the correct column. <u>Always</u> subtract the ones first. The - sign goes at the left hand side alongside the bottom number.

Subtracting the ones: 3-5 = 1 have 3 and 1 want to take away 5. I can't do this (unless I'm working with negative numbers) so I need to take a 10 from the tens column and give it to the ones. I cross out the tens and write the new number above the tens. So I now have 6 tens. Write the 1 ten above, and to the left of the 3 ones, so the calculation is now I have 13 and I want to take away 5. I can do this calculation and the answer is 8. I write this under the ones column between the equals lines. Subtracting the tens: 60-40 = . I have 60 and I want to take away 40. This I can do and the answer is 20. So I have 2 tens and I write the 2 under the tens column between the equals lines.

**Subtracting the hundreds:** 200-600 =. I **have** 200 and I want to take away 600. I can't do this so I need to **take** a 1000 from the thousand column and **give** it to the hundreds. I cross out the thousand and write the new number above the hundreds. So I now have 3 thousands. I write the 1 thousand above, and to the left of the 2 hundreds so the calculation is now I **have** 12 hundreds and I want to take away 6 hundreds. I can now do this calculation and the answer is 600. So I have 6 hundreds and I write 6 under the hundreds column between the equals line.

**Subtracting the thousands:** 3000–1000 =. Remember this is now 3000 because I took one thousand and gave it to the hundreds. So, I **have** 3000 and I want to take away 1000. I can do this and the answer is 2000. So I have 2 thousands and I write this under the thousands column between the equals line.

## Expected at the end of Year 5

**Formal written method of column subtraction:** At the end of Year 5 it is expected the children will be able to subtract whole numbers with more than 4 digits, using formal written methods.

	Tth	Th	н	Т	0	
	7	1	6	1		
	18	2	7	7	5	
—	3	6	4	8	3	
	4	6	2	9	2	

# – Subtraction –

**Formal written method of column subtraction:** Once the children are confident with these written methods they will be taught how to use this column method with decimals, including money. Again, where needed, this would be taught practically first.



	t	h	th	
	3	1		
£	3	4	2	
 £	• 2	2	9	
£	• 1	1	3	

## Expected at the end of Year 6

It is expected by Year 6 children should be able to use the formal written methods of column subtraction so an emphasise is placed on using and applying these methods to solve problems.

Other examples of how the column method may be used:





# **X** Multiplication **X**

## Expected at the end of Foundation Stage

Children will experience equal groups of objects and will count in 2s and 10s and begin to count in 5s. They will work on practical problem solving activities involving equal sets or groups using apparatus.



Children will develop their understanding of multiplication and use jottings to support calculation:

# Expected at the end of Year 1

**Counting in equal steps**: Building on from the work in Foundation Stage the children will continue to work on counting in equal steps in 2s, 5s and 10s. Some children will do this visually or practically to begin with so they see it as grouping objects.



2 + 2 + 2 + 2 + 2 = 10 5 x 2 = 10 2 x 5 = 10 2 x 3 or 3 groups of 2

An Array may also be used as a visual aid to understand that multiplication can be answered in any

order.

3 x 5 = 15 5 x 3 = 15

## Expected at the end of Year 2 continued.

**Partitioning:** By the end of Year 2 some children will be ready to partition a multiplication to answer mentally. They will be encouraged to make jottings to support their working.

1	7	х	3	=				
						Т	0	
1	0	Х	3	=		3	0	
	7	Х	3	=	+	2	1	
						5	1	

By encouraging children to organise their jottings vertically this supports the work in addition and subtraction. It should be stressed to the children the importance of setting their work out correctly.

## Expected at the end of Year 3

**Formal Written Methods of multiplication:** By the end of Year 3 it is expected that children will be able to calculate multiplication statements for the tables they know, including for two-digit numbers times one-digit numbers using formal written methods. Children are expected to know multiplication facts for 3, 4 and 8 multiplication tables.

```
37 x 4 =
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	Н	Т	0	
		3	7	
х			4	
	1	4	8	
		2		

#### Script:

Remember to always write H, T and O above the correct column. <u>Always</u> multiply the ones first. The x sign goes at the left hand side alongside the bottom number.

**Multiplying the ones: 7 lots of 4 = 28** = I have 28. I know I can't put 28 ones in the ones column so I take my tens out and give them to the tens column. Write the 2 just below the answer box in the tens column. Now I put the 8 ones between the equals lines in the one column.

**Multiplying the tens: 30 lots of 4 = 120** *If the children can't tell you what 30 lots of 4 are call it 3 x 4. Explain that this equals 12 but it is 12 lots of 10 which equals 120.* 

I now have my other 2 tens to add on which gives me 140. I now take the 100 out which leaves me 4 tens so 4 can go in the tens column between the equal lines. The 100 goes in the hundred column.

## Expected at the end of Year 4

**Formal written method of multiplication:** By the end of Year 4 it is expected children will be able to multiply two-digit and three-digit numbers by a one-digit using the formal written method. Children are expected to recall all multiplication facts for multiplication tables up to 12 x 12.

Multiplying a three-digit number by a one digit number.

342 x 7 =

	Th	Н	Т	0	
		3	4	2	
х				7	
	2	3	9	4	
		2	1		

#### Script:

Remember to always write H, T and O above the correct column. <u>Always</u> multiply the ones first. The x sign goes at the left hand side alongside the bottom number.

**Multiplying the ones: 2 lots of 7 = 14** = I have 14. I know I can't put 14 ones in the ones column so I take my tens out and give them to the tens column. Put the 1 ten just below the answer box in the tens column. Now I put the 4 ones between the equals lines in the one column.

**Multiplying the tens:** 40 lots of 7 = 280 If the children can't tell you what 40 lots of 7 are call it 4 x 7. Explain that this equals 28 but it is 28 lots of 10 which equals 280.

I now have my other ten to add on which gives me 290. I now take the hundreds out which leaves me 9 tens so 9 can go in the tens column between the equal lines. The 200 goes in the hundred column just below the answer box in the hundred column.

**Multiplying the hundreds: 300 lots of 7 = 2100** *If the children can't tell you what 300 lots of 7 are call it 3 x 7. Explain that this equals 21 but it is 21 lots of 100 which equals 2100.* 

I now have my other hundreds to add on which gives me 2300. I now take the thousands out which leaves me with 3 hundreds so 3 can go in the hundreds column between the equal lines. The 2000 goes in the thousand column.

# Expected at the end of Year 5

**Formal written method of multiplcation:** By the end of Year 5 it is expected children will be able to multiply up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers.

Multiplying a 4 -digit number by a one digit number.

2741 x 6 =

	TTh	Th	Н	Т	0	
		2	7	4	1	
х					6	
	1	6	4	4	6	
			2			

#### Script:

Remember to always write Th, H, T and O above the correct column. <u>Always</u> multiply the ones first. The x sign goes at the left hand side alongside the bottom number.

Multiplying the ones: 1 lot of 6 = 6. I have 6 ones. I put the 6 ones between the equals lines in the ones column.

**Multiplying the tens:** 40 lots of 6 = 240 If the children can't tell you what 40 lots of 6 are call it  $4 \times 6$ . Explain that this equals 24 but it is 24 lots of 10 which equals 240.

I now take the hundreds out which leaves me 4 tens so 4 can go in the tens column between the equal lines. The 200 goes in the hundred column just below the answer box in the hundreds column.

**Multiplying the hundreds: 700 lots of 6 = 4200** *If the children can't tell you what 700 lots of 6 are call it 7 x 6. Explain that this equals 42 but it is 42 lots of 100 which equals 4200.* 

I now have my other 2 hundreds to add on which gives me 4400. I now take the thousands out which leaves me with 4 hundreds so 4 can go in the hundreds column between the equal lines. The 4000 goes in the thousand column just below the answer box in the hundred column.

**Multiplying the thousands: 2000 lots of 6 = 12000.** *If the children can't tell you what 2000 lots of 6 are call it 2 x 6. Explain that this equals 12 but it is 12 lots of 1000 which equals 12000.* 

I now have my other 4 thousands to add on which gives me 16000. I now take the tens of thousands out which leaves me with 6 thousands so 6 can go in the thousands column between the equal lines. The 10000 goes in the tens of thousands column.

## Expected at the end of Year 5 and 6

Formal written method of long multiplication: In Year 5 children are expected to multiply a 4 digit number by a two-digit number using long multiplication. This is then consolidated in Year 6. It is a good idea to cover this Multiply a two-digit number by a two-digit number: digit up when multiplying with the tens. Τh 0 н Т 2 3 It is a good idea to cover this 4 1 х digit up when multiplying with 2 9 2 3 4 х the ones. ₹3 2 2 3 1 0 0 👞 х 2 2 1 When multiplying the tens: Once this has been added on it As no ones are being multiplied is a good idea to cross it out so you put the zero down as a place it's not added again. holder.

#### Script:

Remember to always write Th, H, T and O above the correct column. <u>Always</u> multiply the ones first. The x sign goes at the left hand side alongside the bottom number.

#### Always start with multiplying the top number by the ones of the bottom number first.

Multiplying the ones of the top number by the ones of the bottom number: 3 lots of 4 = 12 = 1 have 12. I know I can't put 12 ones in the ones column so I take my tens out and give them to the tens column. I put the 1 ten just below the tens column. Now I put the 2 ones under the ones digits. Multiplying the tens of the top number by the ones of the bottom number: 20 lots of 4 = 80 *If the* 

children can't tell you what 20 lots of 4 are call it 2 x 4. Explain that this equals 8 but it is 8 lots of 10 which equals 80.

Now I must add the ten I have put under the tens column. So this equals 90. I cross out the ten I have added. I have 9 tens so 9 goes in the tens column under the tens digits.

#### Now multiply the top number by the tens of the bottom number.

Multiplying the tens of the bottom number by the ones of the top number: Before I do any multiplying I put a zero in the next row in the ones column as I am not dealing with the ones. This is called a place holder. See diagram.

10 lots of 3 = 30 I now have 3 tens so this goes in the tens column in the next row.
Multiplying the tens of the bottom number by the tens of the top number: 10 lots of 20 = 200
As this answer is now 2 hundreds 2 goes in the hundreds column.

Now we have completed the multiplications we now need to add our two answers using the standard written method.

## Expected at the end of Year 5 and 6 continuted

Formal written method of long multiplication: Multiply a 4-digit number by a two-digit number:

	HTh	TTh	Th	Н	Т	0							
			6	5	2	3							
					2	5							
х		3	2	6	1	5	6	5	2	3	х	5	
	1	3	đ	4	6	0	6	5	2	3	х	2	0
	1	Ġ	3	0	7	5							
			1										

#### Script:

Remember to always write Th, H, T and O above the correct column. <u>Always</u> multiply the ones first. The x sign goes at the left hand side alongside the bottom number.

Steps to Success:

1. Always start multiplying the top number by the ones of the bottom number.

2. Multiply the ones of the bottom number by each of the top digits recording below the line.

3.Remember to cross out any additional digits that need adding on as you go along.

4. Once each top digit has been multiplied by the bottom ones begin multiplying the tens digit of the bottom number by each digit of the top number.

5. <u>Always</u> write a zero as a place holder before you begin multiplying the bottom tens digit by any of the digits in the top number.

6.Once all multiplications have been completed add the two answers together using the standard column method of addition.

Write the answer between the two lines at the bottom of the long multiplication.

Multiplication and division are concepts which start to be developed in the Foundation Stage, and continue to be built on throughout the child's school life. The connection between multiplication and division must be emphasised from the start, and constantly reinforced.

Division has two aspects, sharing and grouping, which are conceptually very different, although numerically they give the same 'answer'.

For division to be meaningful, it is often best introduced within a context.

Our written methods build on the children's understanding of mental methods, based on place value and partitioning.

## Expected at the end of Foundation Stage

Children will understand equal groups and share items out in play and problem solving. They will count in 2s and 10s and later in 5s.

#### Grouping:

# We have 12 children and we want to put them into three groups.



Children will develop their understanding of division and use jottings to support calculation

## Sharing:

15 marbles shared equally between 5 children



## Some thoughts on division

Consider the following simple word problems, all of which are easily accessible to children in KS1 & KS2:

- I bake 13 buns. I want to share them equally between my 4 children. How many buns will each child get?
- I have £13.00 to share equally between my 4 children. How much money will each child get?
- I buy some marbles. There are 13 in a packet. I want to share them equally between my 4 children. What happens now? (The children come up with some wonderful suggestions, and this, of course, leads to the important question of how many more packets we need to buy before we can share equally.)
- I am having a party for 13 people. I need paper plates which come in packets of 4. How many packets must I buy?
- I made 13 fancy decorations. They have to be packed in strong boxes, with 4 in each box, to keep them safe. How many boxes can I fill?

Clearly, all these problems can be represented using the same number sentence, despite their very different 'answers'. Children need to know from the start that there are these choices to be made, and to ask themselves, 'What sort of answer am I looking for, and what ones am I working in?' This can be expressed as what am I counting in? Am I counting in packets, children, buns or what?



## Expected at the end of Year 3

Partitioning: This method would be used to divide mentally  $39 \div 3 =$  $30 \div 3 \quad 9 \div 3$ 

**Formal written method of short division:** By the end of Year 3 it is expected that children will be able to calculate division statements using the multiplication tables they know, including for two-digit numbers divided by one-digit numbers using formal written methods.

It would be expected that the children will be reminded of the 'talk through' taught in Year 2 so children fully understand the mathematical statement.

69 ÷ 3 =



Remember use the words:

How many lots of?

#### Script:

Remember to always write T and O above the correct column.

Working with the tens first: How many lots of 3 can I take out of 6? The answer is 2. I write 2 in the box above 6.

Working with the ones: How many lots of 3 can I take out of 9? The answer is 3. I write 3 in the box above 9.

Some children may be able to do this easily so should be taught this method to the next level.

72 ÷ 3 =

	Т	0	
	2	4	
3	7	1 2	

Remember use the words:

How many lots of?

#### Script:

Remember to always write T and O above the correct column.

**Working with the tens first:** How many lots of 3 can I take out of 7? The answer is 2. Write 2 in the box above 7. I know 2 lots of 3 is 6 so I have 1 ten left over so that goes into the ones column. I show this by writing a small 1 next to the 2 to read 12.

Working with the ones: How many lots of 3 can I take out of 12? (1 ten plus 2 ones) The answer is 4. There are 4 lots of 3 in 12 so I write 4 in the box above the 12.

## Expected at the end of Year 4

**Formal written methods of short division:** By the end of Year 4 it is expected children will be able to divide two-digit and three-digit numbers by a one-digit using formal written methods.

 $318 \div 6 = \begin{array}{c|cccc} H & T & O \\ \hline 5 & 3 \\ \hline 6 & 3 & 1 \\ \hline & & & \\ \end{array}$ 

#### Script:

Remember to always write H, T and O above the correct column.

**Working with the hundreds first:** How many lots of 6 can I take out of 3? The answer is 0. If the children wish they can write a faint 0 in the box above the three. Or if they prefer they can leave it empty to read the next number as 31.

**Working with the tens:** How many lots of 6 can I take out of 31? The answer is 5. I write 5 in the box above 1. I know 5 lots of 6 are 30 so I have 1 ten left over so that goes into the ones column. I show this by writing a small 1 next to the 8 to read 18.

**Working with the ones:** How many lots of 6 can I take out of 18? (1 ten plus 8 ones) The answer is 3. There are 3 lots of 6 in 18 so I write 3 in the box above the 18.

Some children may be able to do this easily so should be taught this method to the next level using remainders.

852 ÷7=

	Н	Т	0	
	1	2	1	r5
7	8	1 5	<sup>1</sup> 2	

#### Script:

Remember to always write H, T and O above the correct column.

**Working with the hundreds first:** How many lots of 7 can I take out of 8? The answer is 1. Write 1 in the box above 8. I know 1 lots of 7 is 7 so I have 1 hundred left over so that goes into the tens column. I show this by writing a small 1 next to the 5 to read 15.

**Working with the tens:** How many lots of 7 can I take out of 15? The answer is 2. Write 2 in the box above 15. I know 2 lots of 7 are 14 so I have 1 ten left over so that goes into the ones column. I show this by writing a small 1 next to the 2 to read 12.

**Working with the ones:** How many lots of 7 can I take out of 12? The answer is 1. There is 1 lot of 7 in 12 so I write 1 in the box above the 12. 1 lot of 7 is 7 so that means I have 5 left over. We call this a remainder and write it at the end of our answer as a r5.

## Expected at the end of Year 5

**Formal written methods of short division:** By the end of Year 5 it is expected children will be able to divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context.

1449 ÷4 =

	Th	Н	Т	0					
		3	6	2	r1	=	1/4		
4	1	4	24	9					

#### Script:

Remember to always write Th, H, T and O above the correct column.

**Working with the thousands first:** How many lots of 4 can I take out of 1? The answer is 0. If the children wish they can write a faint 0 in the box above the 1. Or if they prefer they can leave it empty to read the next number as 14.

**Working with the hundreds:** How many lots of 4 can I take out of 14? The answer is 3. Write 3 in the box above 4. I know 3 lots of 4 are12 so I have 2 hundreds left over so that goes into the tens column. I show this by writing a small 2 next to the 4 to read 24.

Working with the tens: How many lots of 4 can I take out of 24? The answer is 6. Write 6 in the box above 24.

**Working with the ones:** How many lots of 4 can I take out of 9? The answer is 2. Write 2 in the box above the 9. 2 lot of 4 are 8 so that means I have 1 left over. We call this a remainder and write it at the end of our answer as a r1.

When the children are working in the context of money or measure they will be taught to put the decimal point followed by 00. This will be so the children understand the remainder in the context of the question.

£1449÷4

	Th	Н	Т	O t	h			
		3	6	2 🗕 2	5			
4	£1	4	<sup>2</sup> 4	9 • <sup>1</sup> 0	<sup>2</sup> 0			

Scrip from above. Then follow this for working with the ones, tenths and hundredths.

**Working with the ones:** How many lots of 4 can I take out of 9? The answer is 2. Write 2 in the box above the 9. I know 2 lots of 4 are 8 so I have 1 one left over. This goes in the tenths column. I show this by writing a small 1 next to the 0 to read 10.

**Working with the tenths:** How many lots of 4 can I take out of 10? The answer is 2. Write 2 in the answer box above the 0. 2 lots of 4 are 8 so that means I have 2 tenths left over so that goes into the hundredths column. I show this by writing a small 2 next to the 0 to read 20.

**Working with the hundredths:** How many lots of 4 can I take out of 20? The answer is 5. Write 5 in the answer box above the 0.

# Expected at the end of Year 6

It is expected at the end of Year 6 children will be able to divide numbers by a two digit number using the formal written method of short division where appropriate, interpreting remainders according to the context. At Badsworth School it is suggested that children use the short division for dividing up to 12. This would be the same as the Year 5 example.

**Formal written methods of long division:** It is expected at the end of Year 6 the children will be able to divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions or by rounding, as appropriate for the context.

	Th	Н	Т	0		
		1	6	4	r8	
15	2	4	6	8		
—	1	5				
		9	6			
	—	9	0	•		
			6	8		
		—	6	0		
				8		

#### Script:

Remember to always write Th, H, T and O above the correct column.

**Working with the thousands first:** How many lots of 15 can I take out of 2? The answer is 0. If the children wish they can write a faint 0 in the box above the 0. Or if they prefer they can leave it empty to read the next number as 24.

**Working with the hundreds:** How many lots of 15 can I take out of 24? The answer is **1**. (15 with 9 left over.) Write **1** in the box above 4 in the hundreds column. Write 15 under the 24 and subtract 15 from 24 and the answer is 9. Write this in the hundreds column under the 5.

**Working with the tens:** Bring the 6 tens down next the 9 remaining hundreds. How many lots of 15 can I take out of 96? The answer is 6. (90 with 6 left over) Write 6 in the box above the 6 in the tens column. Write 90 under the 96 and subtract 90 from the 96. The answer is 6. Write this in the tens column under the 0.

**Working with the ones:** Bring the 8 ones down next to the 6 remaining tens. How many lots of 15 can I take out of 68? The answer is 4 (60 with 8 left over) Write 4 in the box above the 8 in the ones column. 4 lots of 15 are 60 so that means I have 8 left over. I call this a remainder and write it at the end of our answer as a r8.

# Expected at the end of Year 6 continued

**Formal Written Methods of division:** Examples of written methods of division with remainders in context.

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$\begin{array}{c c c c c c c c c c c c c c c c c c c $		Н	Т	0				
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$		0	2	8	r	12	=	4
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						15		5
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	15	4	3	2				
1     3     2	—	3	0	Ļ				
-       1       2       0		1	3	2				
1       2	—	1	2	0				
Image: state			1	2				
Image: state								

		Т	0	t	h	
			4	2	2	r2p
7	£	2	9	<sup>1</sup> 5	<sup>1</sup> 6	