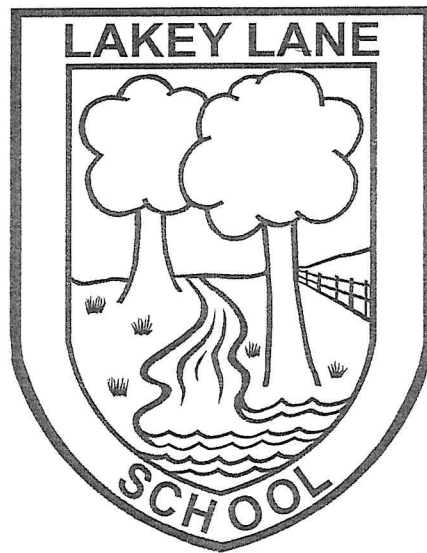
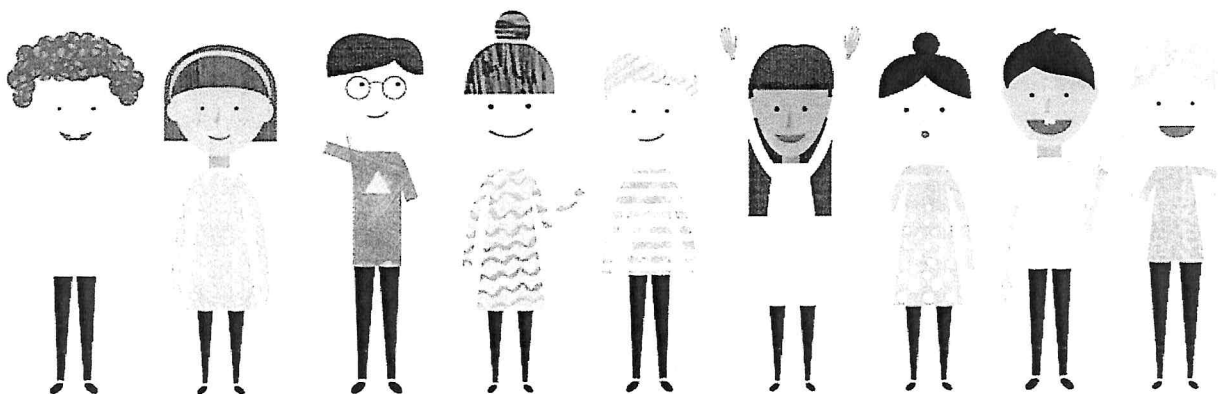


Lakey Lane Primary School



Written Calculation Policy 2019-20



Contents

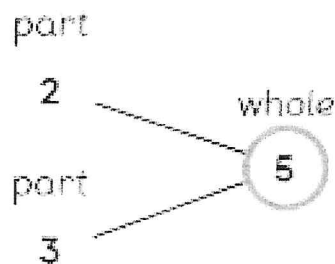
KSI Written Calculation Policy

Addition

Year 1

Drawing on number bonds

Prior to using a written method to solve an addition calculation, year 1 pupils are to draw upon previously learnt number bonds. After recalling on their number bond - e.g. $3+2=5$ - they are to represent this on a 'Part Part Whole' diagram. This does not solve the addition sum but enables them to see the two smaller parts that add together to make a whole.



Counting on

Following the verbal teaching of 'Can you count on from a number in your head...?', introduce the idea of a number line. Prompt that the bigger number in their head is always at the start of the number line. E.g. $3+6$ would be solved by drawing a number with 6 at the start.



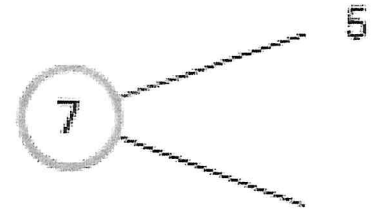
For struggling learners if the number sentence is presented as $3+6=$ allow them to start with the number 3 on their number line. Knowledge of commutative is not expected at this age - despite some children being able to identify that they are the same number sentence.

Completing number sentences

Using their knowledge from the two taught strategies for solving an addition sentence, children are expected to find a missing number.

It is important that pupils are familiar with number sentences presented in different ways. Therefore solving and writing number sentences in different ways.

Begin with a simple 'part' missing from a straight forward number sentence/diagram.



$$7 = 5 + \quad$$

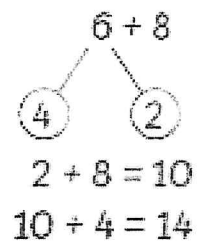
Then progress to something slightly trickier...

$$5 + 2 = \quad + 1$$

'Part Part Whole' diagrams and number lines are used initially up to 10 and once this is secure up to 20.

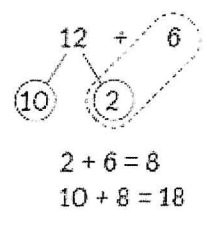
Add by making 10

Adjusting is used when adding two single digit numbers that will total more than 10.



Add by adding the ones

When adding a two digit number and a single digit number - pupils should add the ones first and display their working like this...



Year 2

Initially methods taught in year 1 are revised but involve greater numbers.

Simple adding

When adding a two digit number to a one digit number using dienes and practical equipment, demonstrate the formal *column method* alongside from the get go!

tens	ones
2	5
+	3
8	

Similarly when adding a multiple of 10 - show that the digits in the ones column will remain the same and the value in the tens column is adjusted.

tens	ones
2	5
+	3
2	8

Children should be able to represent addition without renaming initially. Adding both tens and ones.

	tens	ones		tens	ones
	2	3		2	3
	+	1		+	1
		4			4
	7			3	7

Adding with renaming

Column method is again used for adding with renaming but it begins with adding a two digit number and a one digit number.

	tens	ones
	2	4
+		7
<hr/>		
	3	1
<hr/>		

The method taught in MNP then diverts slightly from the traditional making a jotting of the regrouped number and remembering to add it to the total of the column.

This is when addition progresses to two digit add two digit.

	tens	ones
	1	5
+	1	8
<hr/>		
	1	3
+	2	0
<hr/>		
	3	3
<hr/>		

Subtraction

Year 1

Subtract by crossing out



How many sandwiches are left?

$$5 - 1 = 4$$

There are 4 sandwiches left.

Children when faced with a subtraction sentence can pictorially represent their starting amount and then cross out the number in which they are subtracting.

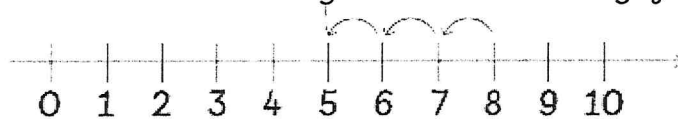
Drawing on number bonds

Prior to using a written method to solve a subtraction calculation, year 1 pupils are to draw upon previously learnt number bonds. After recalling on their number bond - e.g. $4 - 1 = 3$ - they are to represent this on a 'Part Part Whole' diagram. This does not solve the subtraction sum but enables them to see that when a part is taken from a whole, you are left with the other part.



Counting back

Following the verbal teaching of 'Can you count backwards from a number in your head...?', introduce the idea of a number line. Prompt that their starting position is the whole that they are subtracting from and they will 'jump' backwards.



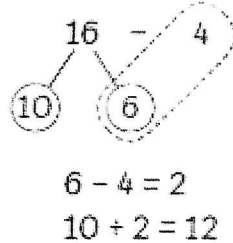
This method is used with subtraction up to 20 on both number lines and hundred squares.

Subtract by subtracting ones

When subtracting a one digit number from a two digit number, children should start by subtracting the ones (regrouping is not required).

For example, if a child was solving $16 - 4 = ?$ their written calculation should reflect their thought process and look like this:

$$\begin{array}{r} 16 - 4 \\ \hline \end{array}$$



$$6 - 4 = 2$$
$$10 + 2 = 12$$

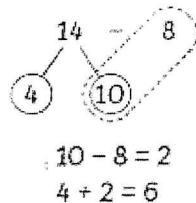


Subtract from 10

This strategy is advocated by MNP and is not crucial but is worthwhile being encouraged for those capable to improve number fluency!

This strategy encourages children to use their knowledge of number bonds to 10 when subtracting a one digit number from a two digit number. Like this:

$$\begin{array}{r} 14 - 8 \\ \hline \end{array}$$



$$10 - 8 = 2$$
$$4 + 2 = 6$$



The idea is that children will easily subtract 8 from 10 and then will use simple addition to add the number they are left with to the partitioned ones.

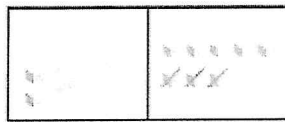
Year 2

Initially methods taught in year 1 are revised but involve greater numbers.

Simple subtracting

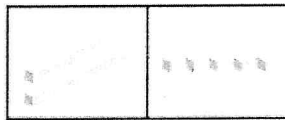
When subtracting a one digit number from a two digit number using dienes and practical equipment, demonstrate the formal *column method* alongside from the get go!

Step 1 Subtract the ones.
 $8 \text{ ones} - 3 \text{ ones} = 5 \text{ ones}$



tens	ones
2	8
-	3
<hr/>	
	5

Step 2 Subtract the tens.

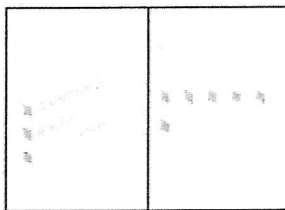


$$28 - 3 = 25$$

tens	ones
2	8
-	3
<hr/>	
2	5

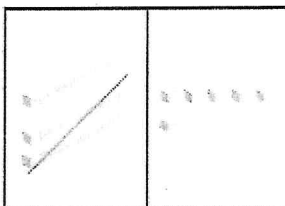
When subtracting a multiple of 10, the same written method applies.

Step 1 Subtract the ones.



tens	ones
3	6
-	0
<hr/>	
	6

Step 2 Subtract the tens.
 $3 \text{ tens} - 2 \text{ tens} = 1 \text{ ten}$

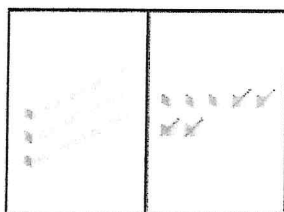


$$36 - 20 = 16$$

tens	ones
3	6
-	0
<hr/>	
1	6

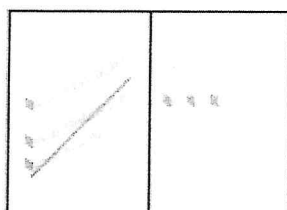
As subtraction progresses to subtracting a two digit number from a two digit number (without renaming) the same method applies...

Step 1 Subtract the ones.
7 ones - 4 ones = 3 ones.



tens	ones
3	7
- 2	4
	3

Step 2 Subtract the tens.
3 tens - 2 tens = 1 ten



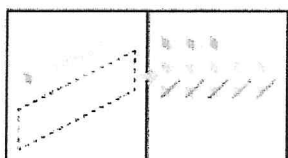
tens	ones
3	7
- 2	4
1	3

$$37 - 24 = 13$$

Subtracting with renaming

Column method is again used for subtracting with renaming but it begins with subtracting a one digit number from a two digit number.

Step 1 Regroup 1 ten into 10 ones.
Subtract the ones.
13 ones - 5 ones = 8 ones



tens	ones
2	3
- 1	5
	8

Step 2 Subtract the tens.

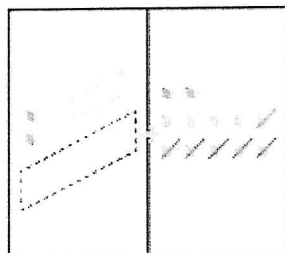


tens	ones
2	3
- 1	5
1	8

$$23 - 5 = 18$$

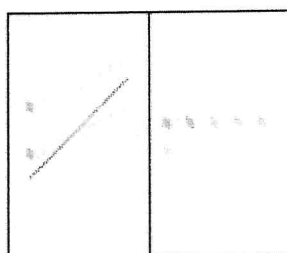
The same method applies when subtracting a two digit number from a two digit number.

- Step 1 Regroup 1 ten into 10 ones.
 Subtract the ones.
 $12 \text{ ones} - 6 \text{ ones} = 6 \text{ ones}$



tens	ones
2	12
3	2
- 1	6
	6

- Step 2 Subtract the tens.
 $2 \text{ tens} - 1 \text{ ten} = 1 \text{ ten}$



tens	ones
2	12
3	2
- 1	6
1	6

$32 - 16 = 16$

Multiplication

Year 1

There is no expectation for year 1 children to use a formal method to multiply. They begin by exploring how to make and identify equal groups and work on doubling to facilitate multiplying by 2.

Year 2

Year 2 begin by recapping the skills taught in year 1 and understanding multiplication as 'a number of groups of...'

Children progress from repeated addition...	$3 + 3 + 3 + 3 = 12$
to how many sets of a number...	4 threes = 12
to how many groups of a number...	4 groups of 3 = 12
to writing a multiplication number sentence	$4 \times 3 = 12$
using the multiplication and equals symbol	

Multiplication using arrays/drawing groups

Within MNP children will be exposed to pictorial representations of multiplication sentences and asked to write the accompanying multiplication sentence or will be provided with the multiplication sentence and asked to represent it pictorially.

For example: $3 \times 2 = \underline{\quad}$ would be represented with a drawing like this...



Children can simply draw dots in circles or lines.

Alongside arrays/drawing groups children can count in 2's, 5's and 10's along a number line or on a hundred square.

Division

Year 1

Year 1 children explore the concepts of grouping and sharing but do not move on to formal written methods to divide.

Year 2

When sharing an amount, children are expected to use their multiplication knowledge. In order to write a division number sentence they use their knowledge of commutativity alongside picture prompts.

When children are giving an amount to 'share' (divide) they are to draw the number of groups and distribute the amount equally across the groups. Like this: $15 \div 5 = \underline{\quad}$



Put 5 cookies
on each tray.



