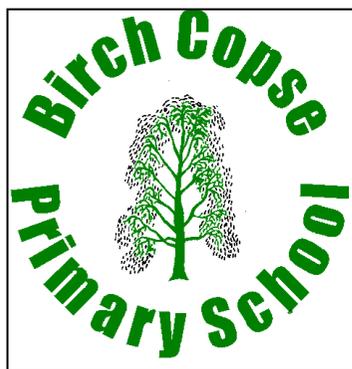


Birch Copse Primary School

A Parents' Guide to Written Methods

Addition



June 2013

Aims of this Booklet.

This booklet aims to provide an outline of the written and mental methods that are taught in mathematics at Birch Copse Primary School.

The methods shown start in the Foundation Stage and progress through to Year 6.

Each year group may cover more than one method within class to ensure that the children have their learning needs met.

The methods shown here are taught to not only enable children to answer calculations but to also solve mathematical problems. We consider the using and applying of these skills critical to progressing in mathematics.

Remember to use the vocabulary 'number sentence' OR 'calculation' instead of 'sum'. Sum means add not calculation.

Mental strategies to support written methods for addition.

This is a list of mental mathematic skills that the children will practise and use in mathematics.

- **Counting on in 1s** (1,2,3,4....)
- **Knowing 1 more (up to 10)** (1 more than 3 is 4)
- **Addition facts to 10** (1+9 2+8 etc..)
- **1 more than a given number** (1 more than 24 is 25)
- **10 more than a given number** (10 more than 32 is 42)
- **Doubles 1-5 (to get totals to 10)** (Double 4 is 8)
- **Use objects to combine 2 groups** (One group of 3 marbles add to one group of 4 marbles equals a total of 7 marbles)
- **Addition facts to 20** (10 + 10 = 20, 14 + 3 = 17, 11 + 4 = 15)
- **Count on in 2s, 5s, 10s from any number** (22, 24, 26.....15, 20, 25.....41, 51, 61)
- **Doubles 1-10 (to get totals to 20)** (3 + 3 = 6)
- **Adding a multiple of 10 to any number** (2 + 20 = 22, 35 + 10 = 45)
- **Knowing 1, 10 more than a given number** (1 more than 247 is 248, 10 more than 326 is 336)
- **Near doubles, e.g. 5 + 4 = 9** (nearly same as 5 + 5 =10)
- **Adding 9 and 11 by adding 10 and adjusting** (16 + 9 would be 16 + 10 -1 = 25)
- **Complements to 100** (70+30, 10 + 90, 45 + 55)
- **Adding any near multiple of 10 then adjusting** (57 + 9 = would be 57 + 10 = 67 then adjusting by taking away 1 so that you have only added 9 and not 10)
- **Complements to 1000** (700+300 or 750+250)
- **Estimating using approximations** (125 + 142 would be calculated as 120 + 140 = 260)

Early Learning Goals

In Foundation, the children are taught to

- find the total number of items in two groups by counting them all.
- say the number that is one more than a given number.
- find one more of a group of five objects, then ten objects.
- in practical activities and discussion, begin to use the vocabulary involved in addition.
- record, using marks they can interpret and explain.

Written method examples and explanation:

The children working towards the Early Learning Goals will learn how to add through a variety of practical activities. Some of these activities will be lead by a teacher and some will be initiated by the children, then extended by an adult.

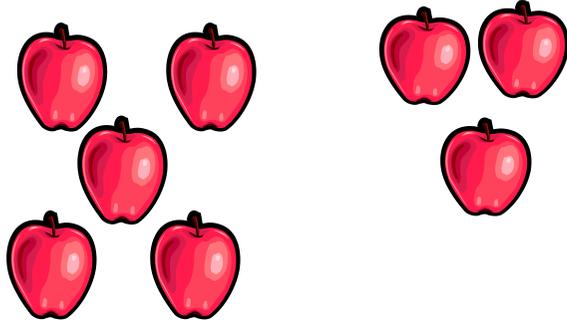
Here are a few examples of activities they may take part in in the Foundation stage.

Emma has got 4 teddy bears and Sam has got 3. How many altogether?

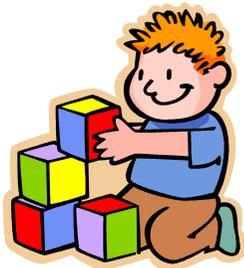


Written method examples and explanation:

Mum buys 5 apples at the shop, then buys 3 more. How many apples does she have now?



Ben is building a tower from blocks. He has used 3 bricks already and adds another 2. How many has he used altogether?



When ready, the children will also be encouraged to record the problems using their own drawings and jottings.

Level 1

At level 1, children should be able to

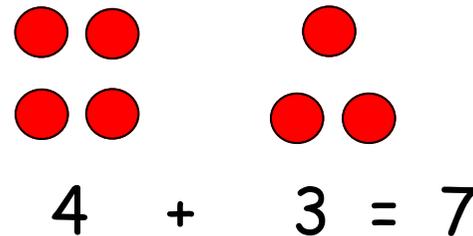
- record their work using objects, pictures or diagrams.
- begin to use + and = to record addition number sentences.

Written method examples and explanation:

At level 1 the children will use objects, such as counters, to solve addition number sentences using numbers that total to 20.

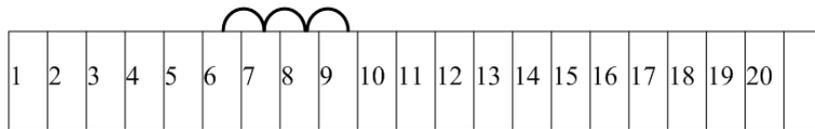
They will count out the correct number of counters for each group then put them together and count the total to find the answer.

They will be introduced to the symbols of addition (+ and =) and learn how to write a number sentence. For example;

A visual representation of the addition sentence 4 + 3 = 7. On the left, there are four red circular counters arranged in two rows of two. In the middle, there is a plus sign (+). On the right, there are three red circular counters arranged in two rows: one in the top row and two in the bottom row. Below the counters, the number sentence 4 + 3 = 7 is written in a large, black, sans-serif font.

Level 2

Once the children are confident in combining 2 sets of objects and counting the total, they will progress to using a number line to solve addition problems.



$$6 + 3 = 9$$

When using a number line, the children start counting from the first number (or largest number in the number sentence) then add by 'jumping' along the number line the correct amount of jumps.

At level 2, the children should be able to record their work in writing e.g. $45 + 54 = 99$

Written method examples and explanation:

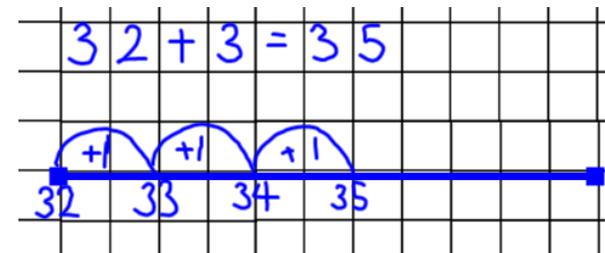
At level 2, the children begin to use larger numbers, that total up to 100, in their calculations. They begin by adding a 1 digit number to a 2 digit number, e.g. $32 + 3 =$

To solve this, they may use a 100 square to count on.

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

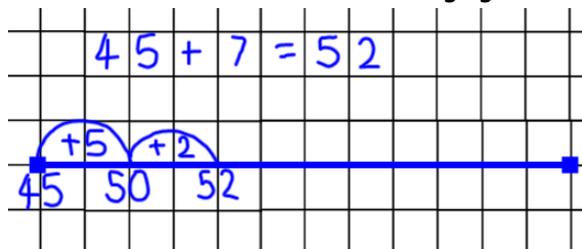
Start at 32, then 'jump on' 3. The answer is the number that you land on.

Alternatively, they may draw a number line to show how they have worked it out.



When the units digits total more than 10, the children use a blank number line to find the total. This is known as 'bridging 10'

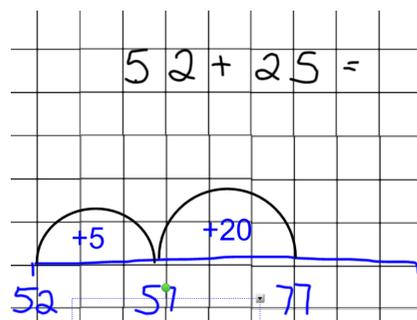
E.g. $45 + 7$



The children 'split' the 7 to get to the next 'tens number', then add the remaining amount.

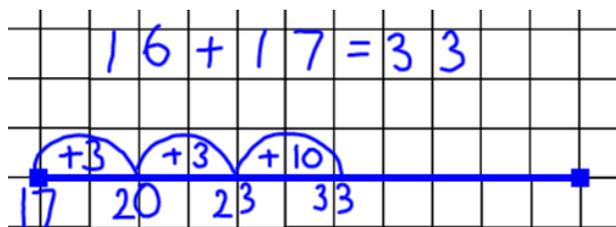
The children then progress to adding two 2 digit numbers.

E.g. $52 + 25$. They write their working out by drawing a number line, as shown below.



If the units numbers total more than 10, they will write it like this.

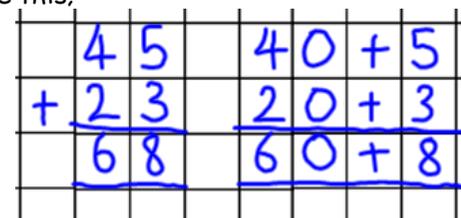
Always start with the largest number on your number line.



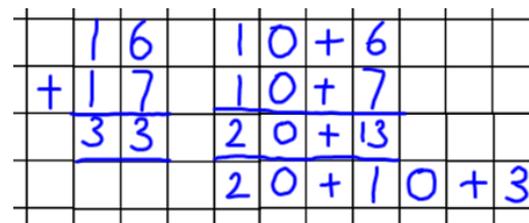
Here, the children add the units they need to get to the next 'tens number' by splitting the 6. They then add the remaining units from the 6, then add the 10s.

Level 2

As well as using the number line, at level 2, children are taught to write their working out by splitting 2 digit numbers in to tens and units, like this:



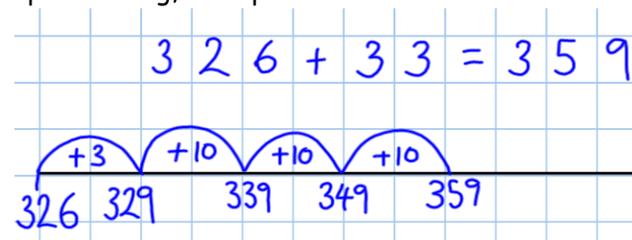
If the units total more than 10, children will record the calculation like this.



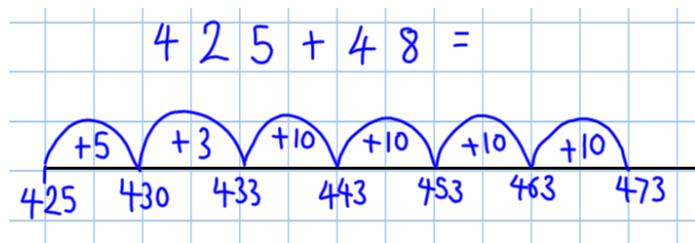
The children will write an extra number sentence underneath which splits the 13 into a 10 and 3.

Moving on from Level 2 to Level 3

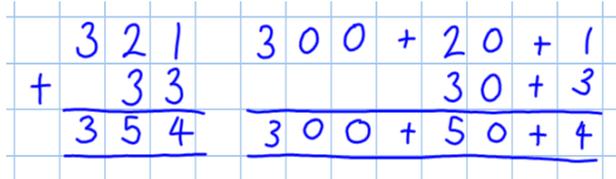
As the children progress in to level 3 addition they will begin using 3 digit numbers in their calculations. They will begin by using adding a 3 digit number and 2 digit number using a blank number line or partitioning, as explained in Level 2.



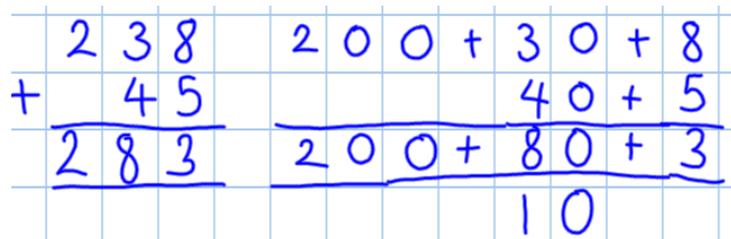
Or like this when 'bridging 10'.



Alternatively, they could use the partitioning method.

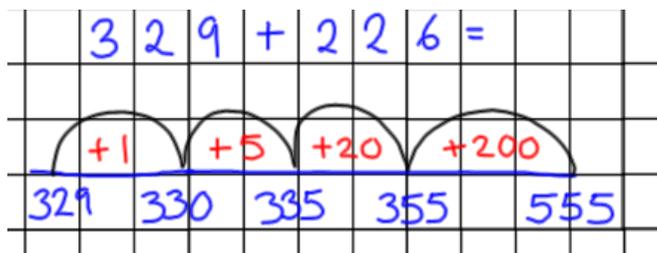


Or, when bridging 10....



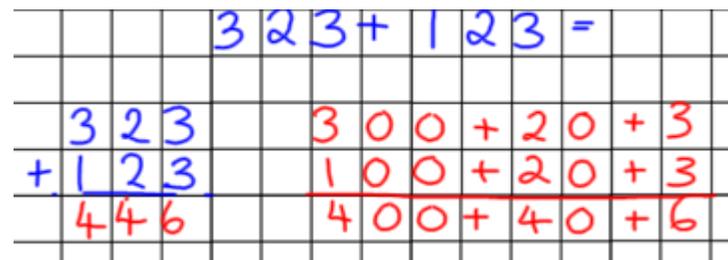
Level 3

Written method examples and explanation:



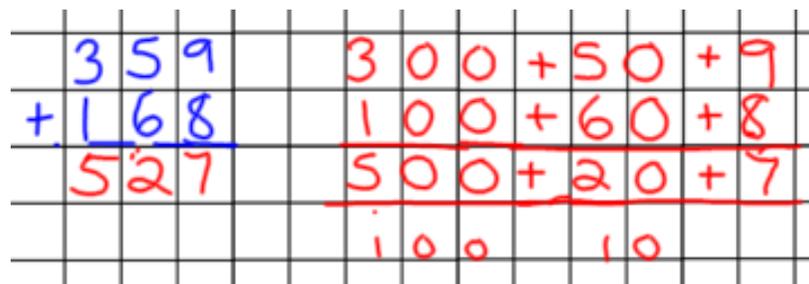
At level 3, the children begin adding with 3 digit numbers. They use the same number line strategy as in level 2, adding the units, then tens, then hundreds.

Adding three digit numbers by splitting each number in 100s, 10s and units, where carrying is not needed as when adding the units, the total does not exceed 9 and adding the tens does not exceed 99.

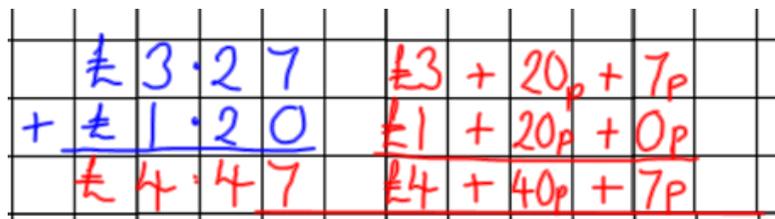


Remember to add from the right (in this case units first).

Adding 3 digit numbers that require carrying, e.g. $9 + 8 = 17$, so the 10 goes underneath the tens numbers and the 7 stays in



Adding three digit amounts of money by splitting each number in 100s, 10s and units, (pounds and pence) where carrying is not needed as when adding the units, the total does not exceed 9p and adding the tens does not exceed 99p.



This strategy can also be used for solving real life problems involving money.

Level 4

At level 4 children are taught how to use efficient written methods for adding three or more numbers of different sizes together and to add decimals to two places

Written method examples and explanation:

Adding multiple sets of numbers

	T _h	H	T	U
	1	2	0	2
			4	5
+		3	6	7
	1	6	1	4

- Add from the right. So in this example, add the units first. E.g. $2 + 5 + 7 = (5 + 2 = 7 \text{ then } 7 + 7 \text{ or } 7 \text{ doubled} = 14)$
- Use the word 'Carry' to explain transfer of digits from one column to the next.
- Be consistent with language, use single digit terminology e.g. $0 + 4$ rather than $0 + 40$. Ensure children understand value of digits, so the 4 in the tens column is worth 4 tens or 40 although we say '4' when we are adding to make it easier.

Adding numbers with two decimal places.

(Including money)

	T	U	$\frac{1}{10}$	$\frac{1}{100}$
	7	7	3	
+	4	8	5	
	1	2	5	8

- Line up the decimal points.
- Put the digits in the correct column
- Add from the right, so in this example, we add the hundredths first. Say 3 and 5 = 8 etc...

Level 5

At level 5 children are taught to add decimals that do not have the same number of decimal places. E.g. 17.98 has two digits after the decimal point and 4.1 has one digit after the decimal point.

Written method examples and explanation:

Adding decimals that do not have the same amount of decimal places.

		1	7	.	9	8
+			4	.	1	0
		<hr/>				
		2	2	.	0	8
		1	1			

Remember:

- Line up the decimal points.
- Use label on top for each column (if needed) E.g. T, U $\frac{1}{10}$ $\frac{1}{100}$
- Ensure digits are in the correct column to show their value (considering place value-so the number 17.98 has 1 ten 7 units 9 tenths and 8 hundredths).
- Add a 'dotted zero' as a place holder (if needed)

Adding multiple sets of decimals that do not have the same amount of decimal places.

			T	U	$\frac{1}{10}$	$\frac{1}{100}$		
			1	7	.	9	8	
					0	.	4	5
+		1	2	3	.	5	0	
		<hr/>						
		1	4	1	.	9	3	
			1	1	1			

See notes on previous page.

Level 6

Children to use the same methods as in level 5, adding multiple integers (whole numbers) and decimals. (Greater than two decimal places)