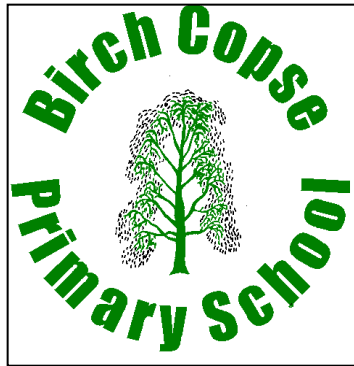


Birch Copse Primary School

A Parents' Guide to Written Methods

Division



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 show progression from Level 1 to level 6.

Each year group may cover more than one method within class ensuring that children are taught according to their needs.

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 division.

This list is progressive but any appropriate method may be used within a level.

- Counting backwards in steps of 2, 5 and 10. (Steps of 2: 8,6,4,2,0 or 9,7,5,3,1) (Steps of 5: 20,15,10,5,0 or 16, 11, 6, 1) (Steps of 10: 30,20, 10, 0 or 33, 23, 13,3)
- Knowing division facts for 2, 5 and 10. ($4 \div 2 = 2$
 $15 \div 5 = 3$ $50 \div 10 = 5$)
- Counting backwards in steps of 3, 4, and 6. (Steps of 3: 9, 6, 3 or 8, 5, 2 Steps of 4: 12, 8, 4, or 11, 7, 3 Steps of 6: 18, 12, 6, 0 or 13, 7, 1)
- Knowing multiplication facts for all the times tables up to 10×10 and corresponding division Facts.
($2 \times 5 = 10$ and $5 \times 2 = 10$ and
 $10 \div 2 = 5$ and $10 \div 5 = 2$)

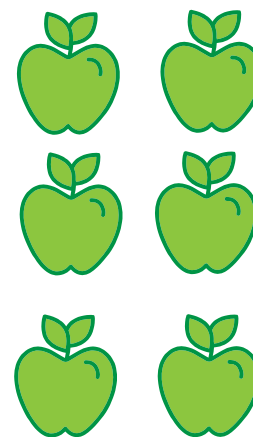
Level 1

At level 1, the children should be able to record their work using pictures, objects or diagrams.

Written method examples and explanation:

At level 1, the children start to learn the idea of division by 'sharing' and will practically share objects in a 'real life' situation.

For example, there are 3 children and 6 apples. If we share them fairly, how many will they get each?



The children will solve this by having 6 apples and learning to share them by giving 1 apple to each child at a time until all the apples are gone. They will then see how many is in each group to find the answer.

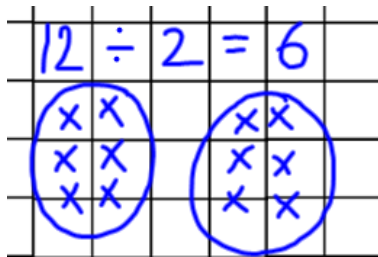
The numbers that the children use to divide at level 1 do not usually have remainders.

Level 2

At level 2, the children should be able to record their work in writing by writing their mental calculations.

Written method examples and explanation:

Children begin by learning how to divide by sharing.

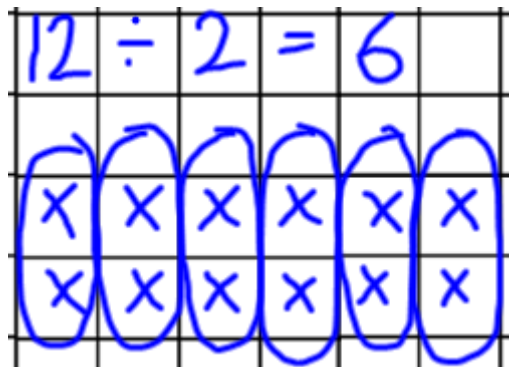


We sometimes refer to this in school as the 'plates' method as we try and get the children to visualise a plate for each person and sharing sweets/apples on to the plates by drawing the crosses.

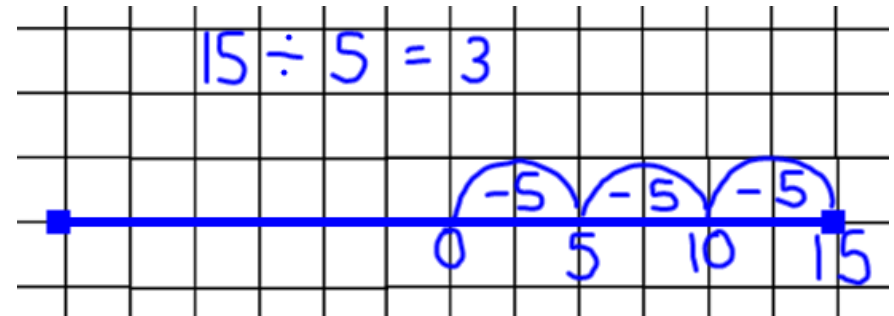
They start by drawing the 2 circles then draw one cross in each at a time until they reach 12. They then count how many is in each group to find the answer.

The children also use another strategy to divide, called 'grouping'.

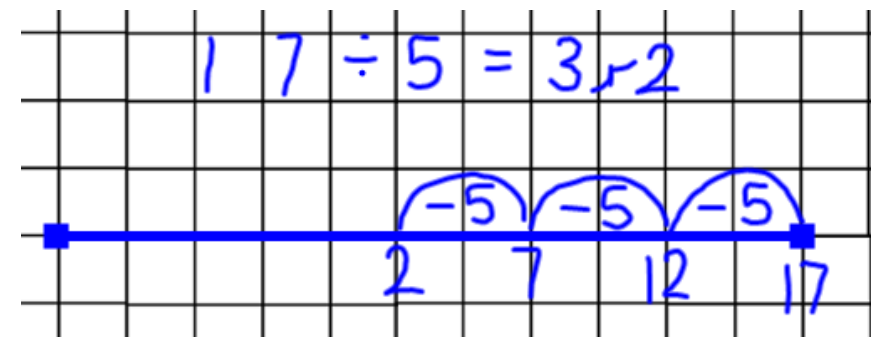
For this method, the children start by drawing crosses. In the example shown, 12. They then put them in to groups by drawing rings around them. In this case, groups of 2. They then count how many groups there are to find the answer.



Additionally, the children are shown how to draw a number line to solve a division problem by taking away in groups and counting how many 'jumps' they have done. This is shown in the example below. The children draw number line and write the number 15 at the end. The children then count back in jumps of 5 until they get to zero. They then count the jumps to find the answer.



Within this level, the children also learn that there can be remainders when dividing. The children count back in jumps of 5s until they are not able to. They then count how many jumps there are and how many left over.



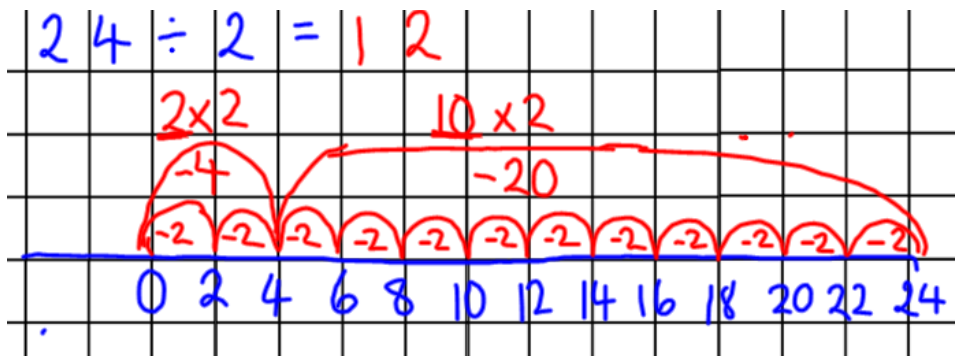
Level 3

Assessment Criteria:

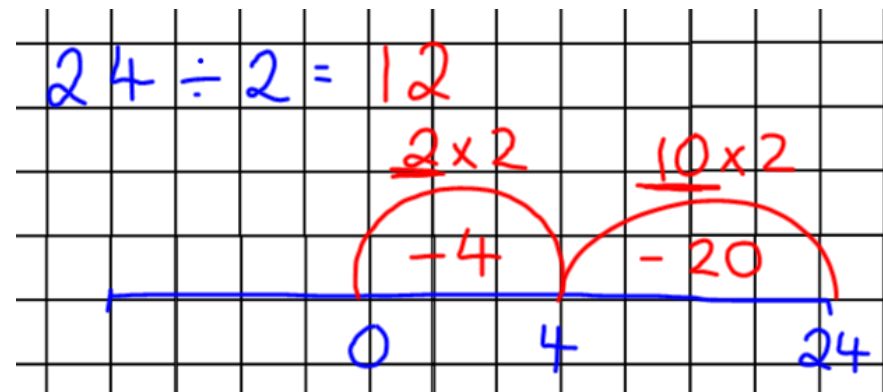
At level 3 children are taught to divide two digit numbers by 2, 3, 4, 5, 10 with whole number answers and remainders,

Written method examples and explanation:

Chunking on a number line- showing individual jumps as well as a 'chunk'



Chunking on a number line.



Level 4

At level 4 children are taught to use short methods for division.

Written method examples and explanation:

Bus stop method, no carrying required.

		2	3
	<hr/>		
3	6	9	

Remember:

- Question is put under the line e.g. 69 divided by 3.
- Use digit terminology
- E.g How many 3s are there in 6 (not 60)
- Start with first digit on the left under 'bus stop'

Bus stop method, carrying, no remainders

		0	4	2
	<hr/>			
3	1	2	6	

Remember:

- If needed put a 'dotted zero' in for a place holder.

There are no '3s' in 1, so we carry the 1 across to the next digit to make '12'

Bus stop method, carrying and remainders

		0	3	7	r2
	<hr/>				
3	1	1	3		

Remember:

How many 3s are there in 1? '0'
Carry the 1 across. How many 3s in 11. 3 remainder 2. Then how many 3s in 23, 7 remainder 2.
Answer— 37 remainder 2.

Bus stop method, remainders as fractions

			3	7	$\frac{2}{3}$
	<hr/>				
3	1	1	3		

Remember:

- Using this example. We are sharing 113 into 3 equal parts which is the same as finding $\frac{1}{3}$ of 113 so we can write any remainders in thirds. So there is a remainder of 2 which is the same as 2 thirds or $\frac{2}{3}$.

Bus stop method, remainders as decimals

			3	7	.	6	6	6
	<hr/>							
3	1	1	3	.	0	0	0	

Remember:

- Keep going dividing each digit by (in this case) 5, until there are no remainders or the answer above the line is repeated (reoccurring)
- The dot above the number (in this case above the 6) means that the 6 is reoccurring.

Level 5

At level 5 children are taught to use division with decimals to two places, e.g. *Divide decimal numbers by a single digit*. Children are also taught how to use an appropriate non-calculator methods for solving problems that involve dividing any three digit numbers by any two-digit number.

Written method examples and explanation:

Short division—using 'Bus Stop' method

Division with decimals with two decimal places. Answer with a remainder. See the level four methods for guidance as this is using the same method.

$$\begin{array}{r} 0 \text{ } 9.56 \text{ } r3 \\ 5 \overline{) 47.83} \\ \underline{5} \\ 4 \\ \underline{4} \\ 0 \\ \underline{0} \\ 0 \\ \underline{0} \\ 0 \end{array}$$

Division with decimals with two decimal places. Answer as a decimal.

$$\begin{array}{r} 0 \text{ } 9.566 \\ 5 \overline{) 47.830} \\ \underline{5} \\ 4 \\ \underline{4} \\ 0 \\ \underline{0} \\ 0 \\ \underline{0} \\ 0 \end{array}$$

Remember:

- Keep going dividing each digit by (in this case) 5, until there are no remainders or the answer above the line is repeated (reoccurring)

'Bus Stop' method dividing three or four digit numbers by two digit numbers with decimals with two decimal places. Answer as a decimal.

$$\begin{array}{r} 198.22727 \\ 22 \overline{) 4361.500000} \\ \underline{44} \\ 36 \\ \underline{33} \\ 61 \\ \underline{66} \\ 50 \\ \underline{50} \\ 00 \\ \underline{00} \\ 00 \\ \underline{00} \\ 00 \end{array}$$

First (in this case) count in 22s and make jottings of this. Then use the same method as in previous examples. So... calculate how many 22s go into 4; none so carry the 4 onto the next digit—see how many 22s go into 43 (use the jottings to help with this) Continue until there are no remainders or the digits in the answer are repeated.

Jottings →

- ① 22
- ② 44
- ③ 66
- ④ 88
- ⑤ 110
- ⑥ 132
- ⑦ 154
- ⑧ 176
- ⑨ 198
- ⑩ 220

Level 6

Children are to use written methods from Level 5. To be able to do these with any decimal and whole number.