Cheddington Combined School

Progression in Calculations
Foundation Stage & Key Stage 1

Parental Guidance Booklet

CONTENTS

INTRODUCTION

This booklet aims to explain how we, at Cheddington Combined School, teach your child different methods of calculation as they progress throughout the school. There are two booklets – one for Key Stage One and one for Key stage two. The methods talked about in each booklet include not only written calculations but also mental methods of calculating.

The methods may look different to what you are familiar with but they may be how your child will be learning to calculate at school. Hopefully, the explanations of the different methods will help you to understand how certain aspects of numeracy are approached in teaching today and enable to help your child as much as possible. Obviously, this is written as guidance for you, but if you are confused about anything your child is learning in their class you should approach the teacher or numeracy co-ordinator.

There is a strong emphasis on mental calculation strategies from foundation stage and it is not until your child progresses through Key Stage 2 that more formal methods of written calculations are introduced. Your child will be building on the experience that they learn year by year and by the end of Key Stage 2 when they move onto secondary education they will be well equipped to deal with numeracy at a higher level.

In general all calculations are written horizontally at first, until children decide which way to work them out
 e.g.

    45 + 13 =   **NOT** vertically

                                     45

                                   <u>+13</u>

Children are becoming more familiar with the words associated with the different number operations (addition, subtraction, division, multiplication) and this is something that we encourage you to continue with at home. This greatly helps children in being able to decipher word

problems and using and applying maths, an area in which there is a large emphasis now.

As your child progresses through Key Stage 1 and Key Stage 2 they will be taught different methods of addition, subtraction, multiplication and subtraction. Some methods they will like and understand straight away and others they may struggle with. Each method builds on another, but it is important to remember that they do not need to be an expert in every method. The aim is for children to find the easiest, quickest and most efficient way for them to work out an answer. This may not be the method you were taught!

FOUNDATION STAGE & KEY STAGE 1
(Reception, Year 1 and Year 2)

Counting is important so that children learn the order of numbers and where numbers are in relation to other numbers. Counting forwards and backwards sets a foundation for early addition and subtraction. Counting in different steps sets a foundation for early multiplication and division.

Using a number track, number line or 100 square (see resources at the back of this booklet for these) when counting, helps children to see and recognise the number they are saying and also to see where that number appears in relation to the other numbers.

It's important for children to know how close 10 is to 7 and how far 10 is away from 97.

# ADDITION

Foundation Stage / Reception

During foundation stage, your child will have plenty of opportunities to experience practical activities and discussions linked to counting. These will involve counting objects up to 10 (or more), estimating the number objects in front of them and then checking and finding one more than a number from 1 to 10. Your child will be hearing different vocabulary associated with addition and will begin to relate addition to combining two groups of objects.

Year 1

During Year 1 your child will begin to use the signs associated with addition and start to record mental calculations. They will extend their counting knowledge and begin to count on in ones, twos, fives and tens. Resources used to help will be cubes, numbered and blank number lines, number tracks and hundred squares. From early on we use a number line to record addition.

e.g.

14 + 3
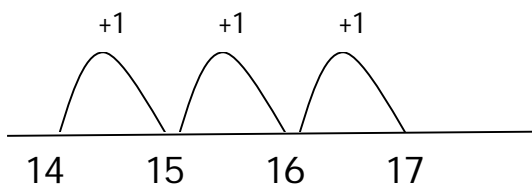
> § Children draw a straight line and then put the initial number in the correct place on the number line (14 in this case). Children are taught to always move from left to right (i.e. the numbers increase as you move to the right along the number line).
> § Children then count on three (one at a time) from 14, drawing in the arcs. They can then work out what number they have landed on.

Year 2

By the end of Year 2 it is hoped that all children will be able to recall addition facts for each number to at least 10, all pairs with totals of 20 (know as number bonds to 20) and all pairs with multiples of 10 with totals of up to 100. Mental methods of calculation are extended involving children being able to add mentally a single digit number of multiple of 10 to any two digit number.

Children will continue to use a number as in Year 1 but will begin to extend the number involved in a jump from beyond one at a time.

e.g.

14 + 13
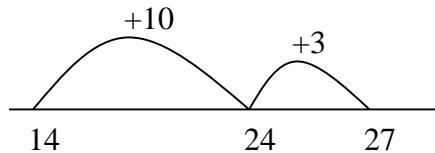
§ With this method children are encouraged to partition (they will have come across this when learning about place value) 13 into 10 and 3.
§ They then add 10 onto 14 followed by the 3
§ Children need to be more secure on their place value before moving on from counting on one at a time.

During Year 2 children will also follow on this idea of partition to carrying out addition using what we call informal jottings. Partitioning is a method used to carry out calculations mentally so it is with this as a basis that we 'jot' down workings out. This is purely a way for children to show their workings out it is not writing down a method more formally – this is approached in Key Stage 2.

e.g.

14 + 13   =   10 + 4 + 10 + 3

10 4 10 3   =   20 + 7

=   27

During Key Stage One children will also be encouraged to think about number sentences and to work out an unknown:

e.g.

☐ + 8 = 12

SUBTRACTION

Foundation Stage / Reception

As with addition the emphasis is on practical activities and discussion. Children will be encouraged to find one less than a number from 10 and be introduced to different vocabulary linked to subtraction.
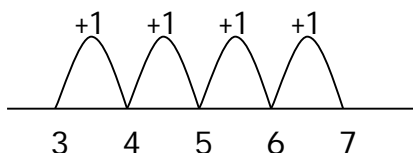
Year 1

During Year 1 your child will begin to use the signs related to subtraction and begin to understand subtraction as take away and finding a difference by counting up. They will use practical and informal written methods, particularly focussing on number lines, number tracks and 100 squares.

e.g. 15 – 3 = 12
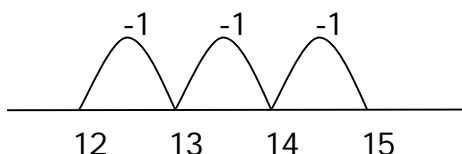
> § Children draw the number line and place 15 at the right hand side. They work backwards along the numberline showing that the number gets smaller
> § They count back in ones

e.g. find the difference between 3 and 7

> § Children draw the number line and place 3 and 7 in the correct order on the number line.
> § They then count in ones from 3 up to seven, drawing in the arcs.

Year 2

During Year 2 both the methods used in Year 1 are extended into making larger jumps on a number line. There is an emphasis on mental strategies for working out subtraction. Children are taught not only to use a number line by counting backwards (example A below) but also forwards (example B) for subtraction. This method of counting up from the smaller to the larger number is often used when finding the difference between two numbers, but it can be used for any subtraction calculation.
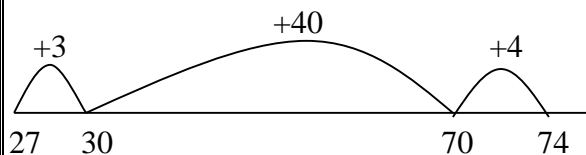
Example A

74 – 27 = 47
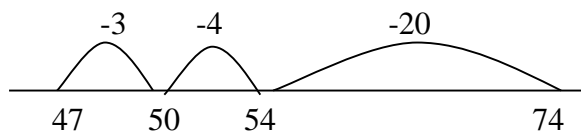
§ After drawing the number line place 74 on the right hand side.
§ Children then count back in manageable steps (multiples of 10, back to nearest 10)

Example B

74 – 27 (interpreted as find the difference)

§ Draw the blank numberline and then place 27 and 74 in the correct place
§ Then work from the 27 up to the 72. Add up to the nearest 10 (30), then in multiples of ten (up to 70) and then the last jump up to 74.
§ This is in manageable steps.

During Year 2 your child will also start to write down informal methods which link to working out answers mentally. This method as well as the number line method will be built on in Key Stage 2.

36 – 24 =   36 – 20 - 4
        =   16 - 4
        =   12

§ Thinking about partitioning split up the 24 into 20 and 4
§ Take away the 20, then take away the 4
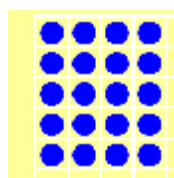
MULTIPLICATION

Reception / Foundation Stage
Working practically your child will gain experience in doubling, counting in 2s and 10s, putting objects into groups and will begin to become familiar with the appropriate language.

Year 1
Your child will continue to count in 2s, 5s and 10s and gain experience in the appropriate language. They will start to look at multiplication as arrays and understand that it does not matter which way round the numbers are.
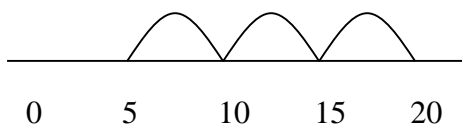
 or
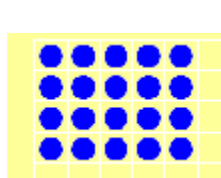
5 X 4 = 20   4 x 5 = 20

Year 2

Your child will continue to look at multiplication as arrays and also begin to understand multiplication as repeated addition, carrying out calculations on a number line.

4 x 5 = 20

0   5   10   15   20

§ Draw the blank number line with 0 at the beginning.
§ Count on in groups of 5 four times

DIVISION

Reception / Foundation Stage
Your child will begin to share objects practically into equal groups and then count how many in each group.

Year 1
Your child will solve practical problems that involve sharing into equal groups. Division is a hard concept for children to understand as there are two ways of looking at the problem. During Year 1 both approaches will be looked at by your child with the emphasis moving towards example 2 as this links to more formal methods used later on in Key Stage 1 and into Key Stage 2.

12 divided by 2 (12 shared into 2 groups)

12 divided by 2 (12 shared into groups of 2)

It is important for children to understand as early as possible the idea of grouping rather than sharing. As mentioned, this is an extremely difficult concept to come to grasps with but this will be worked on each year as your child progresses throughout the school.

Year 2
During Year 2 division is represented as repeated addition (groupings)..
Your child will use practical and informal written methods on a number line in order to calculate answers.

$12 \div 2 = 6$

0   2   4   6   8   10   12
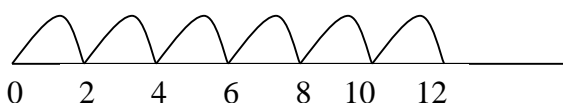
- § Draw a blank number line at place 0 at the beginning.
- § Count in groups of 2 up to 12.
- § Count the number of groups (arcs drawn)

Hundred Square

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

Number Line

```
0  1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16
```
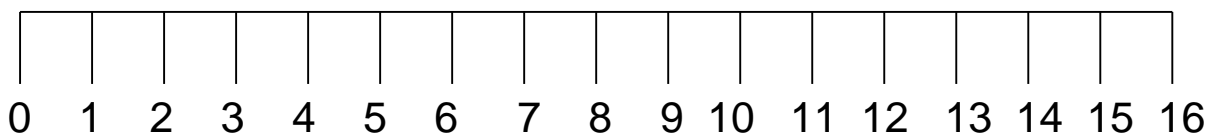
Multiplication Square

x	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

Number Tracks
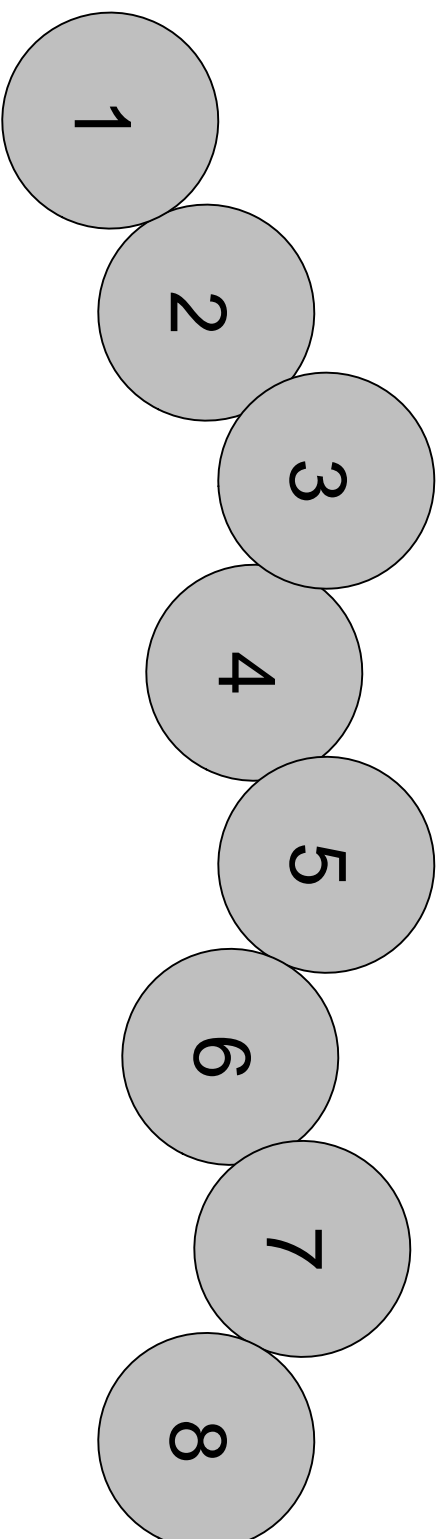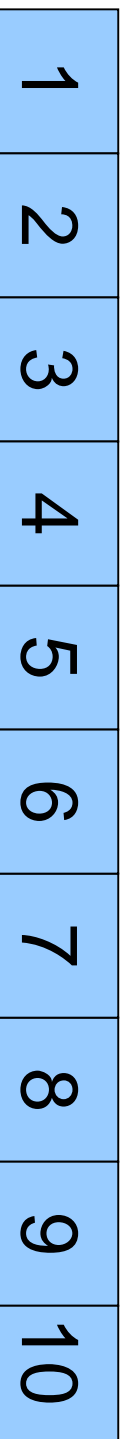
1	2	3	4	5	6	7	8	9	10

1 2 3 4 5 6 7 8

This booklet aims to explain how we, at Cheddington Combined School, teach your child different methods of calculation as they progress throughout Foundation Stage and Key Stage One