Progression in methods taught at Mickleover Primary for written calculations

Dear Parents

Please find attached a progression of the methods that your child will encounter in each phase when learning written methods for addition , subtraction, multiplication and division. They have been taken from the school Calculation Policy which can be found in full, on the school website in the 'Parents' section. Please retain your copy for reference but they will also be available on the School Website.

Please find time to look through the methods used, as these will be the methods that your child will be taught in class in this and future years. It can be helpful for parents to ask their child to show them and explain the methods that they are being taught in school. The ability to explain will aid their understanding. Please refrain from supporting your child by teaching other methods which do not form part of our policy.

Please return the slip below indicating that you have received this document and should you require any clarification of the methods being taught please comment below. We are hoping to run workshops in the Autumn Term 2016.

Many thanks

Mrs M. Harrison (KS 2 Maths Coordinator)
Mrs S. Sharpe (KS 1 Maths Coordinator)

I have received a copy of the progression of written calculation methods. _____

I would be interested in attending a workshop on Ks1 ☐ ks 2 ☐

Addition ☐ Subtraction ☐ Multiplication ☐ Division ☐

KS1 Copy

Progression in written addition methods

Foundation 2

Children find the total of objects in 2 groups by counting all of them.

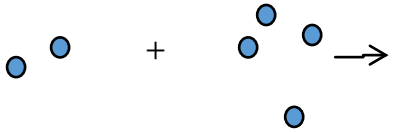
- Through practical activities, using fingers and through discussion they will begin to use the vocabulary involved in addition.

'You have five apples and I have two apples. How many apples altogether?'

- They will record pictorially then numerically
  5 + 2=7 apples

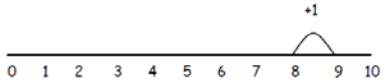
Children add 2 single digit numbers by counting on.

- Through practical activities, children to begin counting on, starting from the highest number.



4 + 2 = 6

- Using a number line counting from the biggest number.



8 + 1 = 9

Children will find one more than a given number.

- Through songs, rhymes and practical activities children develop a sense of number.
- Children will use number line to find one more than a given number .

Year 1

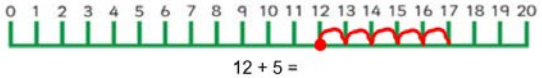
Children, read, write and interpret mathematical statements involving addition (+) and the equals (=).

- Through practical activities, using rods, cubes, numicom, number beads, number lines and 100 squares .

5 + 3 =

Children add one- digit and two-digit numbers within 20, including zero

- Using practical equipment children combine groups, counting from the largest.
- Using a number line to add two numbers together , encouraging children to start from the largest number.

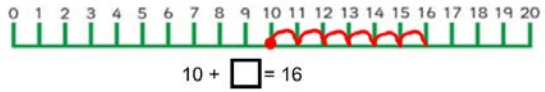


12 + 5 =

- using number bonds and related addition facts within 20 which have been learned.
- Using a 100 square to add in steps of 1 or 10.

13 + 2 = 15

Children solve missing number problems by counting on from the given number. eg 10 +___ = 16



Year 2

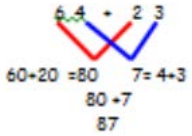
Children solve problems with addition using concrete objects and pictorial representations. Children will learn to add -:

1. A two digit number and ones
2. A two digit number and tens
3. Two two-digit numbers
4. Three one-digit numbers

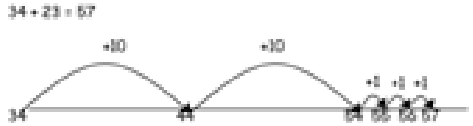
- Using place value knowledge children combine Tens and Ones to add.

T	O
1	3
2	1

10 +20 = 30
3 + 1= 4
30 + 4 = 34

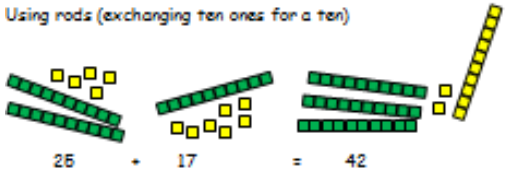


- Using an empty number line to add two-digit numbers.



- Using Tens and Ones apparatus children add by combining groups, counting from the largest.

Using Tens and Ones apparatus children add by combining groups, where 10 ones are exchanged for a Ten .



Progression in written subtraction methods

Foundation 2

Children will engage in a variety of counting songs, rhymes and practical activities to develop a sense of number.

Children will find one less than a given number.

- In practical activities , using objects and fingers they will begin to use the vocabulary involved in subtraction

'You have five apples and I eat one apples. How many apples left?'

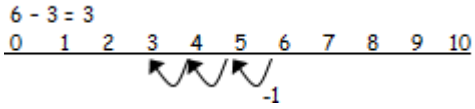
- They will record pictorially then numerically
  5- 1 = 4 apples

Children subtract from 2 single digit numbers, by counting back to find the answer

- Using objects then pictures, chiuldren subtract a single digit number

5 subtract 3 = 2

- Using a number line children count back below the line to show subtraction.

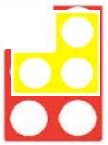


Year 1

Children read, write & interpret mathematical state-ments involving subtraction (-) & equals (=).

- Through practical activities, using rods, cubes, numicom, number beads, number lines and 100 squares .

5 - 3 = 2



Children subtract one-digit & two-digit numbers to 20, including zero.

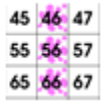
- Using a number line to subtract a number, counting back below the line.

- using number bonds and related addition facts within 20 which have been learned.

- Using a 100 square to add in steps of 1 or 10.

15 - 2 = 13

66 - 20 = 46



Children begin to find the difference using subtraction.

Year 2

Childen subtract numbers using concrete objects and pictorial representations. . Children will learn to subtract -:

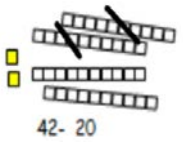
- A two digit number and ones
- A two digit number and tens
- Two two-digit numbers

- Using knowledge of addition and subtrasction families and the inverse relationship od addition and subtraction.

3 + 2 = 5 2 + 3 = 5 Number
5 - 2 = 3 5 - 3 = 2 families

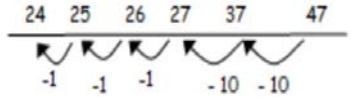
48 + 36 = 84 so 84 - 36 = 48 Inverse

- Using place value knowledge children subtract Tens and Ones.

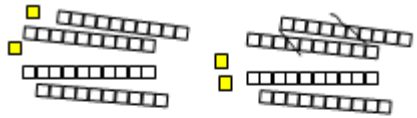


42- 20

47 - 23 = 24

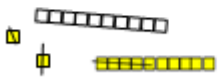


- Using Tens and Ones apparatus children subtract by removing rods where 10 ones are exchanged for a Ten .



42 - 27 42- 20

subtract 7 by exchanging a ten rod for 10 units



42-27= 15

Progression in written multiplication methods

Foundation 2

Children solve problems involving doubling.

- In practical activities and through discussion children will begin to use the vocabulary of multiplication – groups, lots, double.
- Through practical activities solve problems including doubling.

'You have 3 lollies and your friend gives you 3 more. How many do you have altogether?

They will record pictorially then numerically -:

3 + 3 = 6 lollies

Double 3 is 6

Year 1

Children solve one-step problems involving multiplication using concrete objects, pictorial representations

- Children count in 2's, 5's and 10's.
- Children use the vocabulary of multiplication – groups, lots, double.
- Children recognise doubling as adding the same number again.

Children will put objects and pictures into groups to count repeated groups of the same size.

Year 2

Children recall & use multiplication facts for 2, 5 & 10 tables, including recognising odd and even numbers.

- Using a 100 square to find and discuss patterns when counting.

4	5	6	7	8	9	10
14	15	16	17	18	19	20

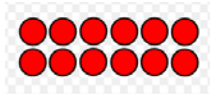
Children solve multiplication problems practically, using concrete objects, arrays, repeated addition and multiplication and division facts.

- Children solve multiplication calculations through repeated addition.

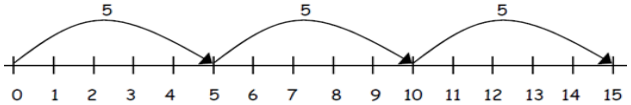
5 + 5 + 5  3 × 5 = 3 groups of 5 = 15

5 5 5

- Children draw dots to show multiplication. (arrays)

2 x 6 =  6 x 2 =

- Number lines are used to show multiplication as repeat addcition.



5 x 3 = 5 + 5 + 5

- Children record calculations using x and =.

Progression in written methods for division

Foundation 2

Children solve problems involving simple halving and sharing

- In practical activities, using objects and pictures and through discussion they will begin to use the vocabulary involved in division – groups, sharing.

'You have 6 buns and give your friend half. How many do you each have?'
They will record pictorially.

Year 1

Children count on and back from different numbers in 1s and then in multiples of 2, 5 and 10.

Children solve problems involving division using concrete objects and pictorial representations.

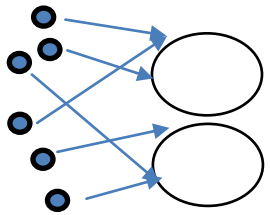
- Through practical activities children will find half and then a quarter by sharing.

4 cakes shared between 2 people. How many do they get each?

Children use objects to group and share amounts to develop an understanding of division in a practical sense.

- <u>Sharing</u> – Children will have practical opportunities to share out by giving one to each plate.

E.g. 6 sweets are shared between 2 people.
How many do they have each?

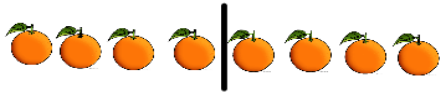


Year 2

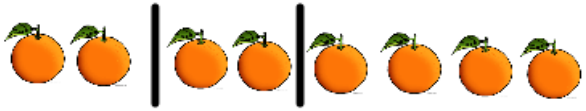
Children recognise odd and even numbers and recall division facts for the 2, 5 and 10 multiplication tables.
E.g. Sort these numbers into odd and even
15, 27,34, 75, 82

Children find a half, a quarter, a third and three quarters of shapes, objects and numbers.

- Using and sharing objects



1/2 1/2



$\frac{1}{4}$ $\frac{1}{4}$ 2 Quarter 2/4 = $\frac{1}{2}$

Children partition tens and ones with larger numbers to find half, a quarter and three quarters

Find half of 48

48 = 40 + 8
Half of 40 = 20
Half of 8 = 4
Half of 48 = 20 + 4 = 24

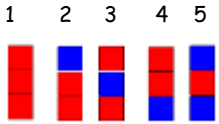
Children continue to use grouping and sharing for division using practical apparatus as taught in year 1.

, repeated subtraction and arrays are introduced in year 2.

- Grouping – Children will have poractical opportunities to put objects into groups of a specific number.

E.g. There are 6 sweets. How many people can have 2 sweets each?

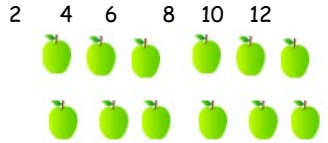
If you have 15 cubes. How many towers of 3 cubes can you make?'



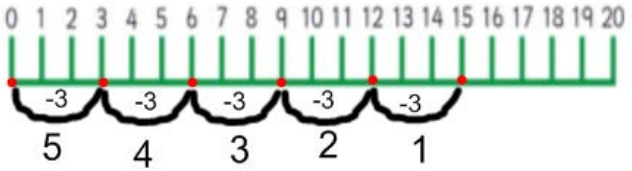
- Children will use jottings to record both sharing equally and grouping. Then they begin to use the ÷ sign to record their division problems.

6 ÷ 2 = 3

- Mental methods, and division facts - Children count regularly, on and back, in steps of2, 5 and 10 using concrete objects or pictoral representations.



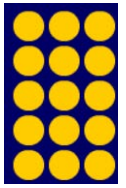
- Repeat subtraction - Children recognise division as repeat subtraction.Using a numberline children start with the total amount to be divided (the first number). They then jump back in steps of the divisor (the second number) until they reach 0. By counting the number of steps taken we find the answer.

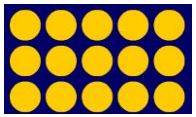


15 ÷ 3 = 5

NB. We always count backwards below the line for subtraction.

- Arrays - Children will be introduced to arrays as a pictorial representation to show division.





15 ÷ 3 = 5

.

There are 5 groups of 3.

15 ÷ 5

There are 3 groups of 5

E.g. 15 pencils shared between 3 pots, how many in each pot?

Children calculate mathematical statements for division within the multiplication tables and write them using division (÷) and equals (=) signs.