# Mathematics at St William of Perth CP School.



# We want our children to be number happy! YOU CAN HELP!!



But it isn't like it was in my day!!

# Maths in the past!

 In the 1960s, a lot of time was given to practising methods.



 Research shows that despite this some children found certain methods difficult, forgot them rather quickly or made persistent errors.

 Sometimes, the result was a dislike of the subject, which could persist into adult life.

 With the 1970s bringing the introduction of calculators, people began to debate what calculating skills are actually needed in life.

# Good practice in Maths today! <u>Mental before written!!</u>

 We need to first develop a sense of number.

I'm only five but I've gone right off the idea of maths!

# Good practice in Maths today! Mental calculation skills are vital. Children need the ability to estimate.

e.g. If I have 18 sweets in one bag and 33 sweets in another bag, how many do I have altogether.



Children can estimate by adding 20 and 30 and know that roughly the answer should be around 50.

# Good practice in Maths today!

All children need to learn maths in a real life context.

As well as knowing 7x7=49. Children need to be able to do the following: There are 7 fields, each field has 7 sheep in them. How many sheep are there in total?

Children need to be able to explain how they have calculated something using a method that suits them. If they can't explain it, they don't fully understand it.

Written calculations, are taught but when children are ready. Examples of written calculations which should be done mentally in Year 3 and Year 5!



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**Counting** of objects and mental counting.

 Early stages of calculation with learning of addition and subtraction number facts, with recording.

5 + 8 = or 13 = + 5

Work with structured number lines

Work with larger numbers, unstructured number lines and informal jottings.

e.g. 47 + 26





**Informal written methods**, first with whole numbers and decimals.

- Use of **calculators** for more difficult calculations.
- With any calculation, teach children to **consider first whether a mental method** is appropriate and remembering to estimate first.

# What does a maths lesson look like?



Oh look, these numbers make a lovely pattern.

# The New National Curriculum

- Providing access to mathematical concepts for all children improve understanding
- Pupils should make connections in mathematics- real life
- Use representations to support learning
- Deep rather than superficial learning building blocks
- Calculating with confidence rapid recall of facts and different strategies
- Explain solutions and use the language of maths

"EDUCATION IS THE MOST POWERFUL WEAPON WHICH YOU CAN USE TO CHANGE THE WORLD." NELSON MANDELA

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# Addition

1. Practical addition of real objects.

- 2. Mental addition of number facts.
- 3. Use of a structured number line to add.



# 4. Partitioning to add.

#### 5. Use of an unstructured number line.



# Addition cont .....

6. Beginning to record vertically. Adding the least significant digit first.

#### 126 +57=

Estimate: 126 +57 is nearly 130 + 60 so estimate answer should be near 190.

# Addition cont .....

 7. Standard vertical method involving carrying. When children are confident working with larger numbers using the previous strategies, they will be introduced to 'carrying' digits. Usually this is during Year 5 and 6. 2856+1095

Estimate: 2900+1100 =4000 Answer should be less as I have rounded up.



# Addition cont .....

#### 8. Adding decimals

This is first introduced through money and measures. As with all vertical methods, children should know how to line up place value columns and the decimal point under each other.

 $\pounds 5.75 + \pounds 3.18 =$ 

#### Estimate: £6.00 + £3.00 = £9.00

£5.75 + £3.18	
0. 13 0. 80 8. 00	(0.05+0.08) (0.70+0.10) (5.00+3.00)
£8.93	

# Subtraction

**1. Practical** subtraction of real objects.

2. Mental subtraction of number facts.





3. Use of a structured number line to add.



- 4. Use of an unstructured number line.
  123 47=
  - Estimate first 120 50 = 70



5. Counting on

(Complimentary addition)

How shopkeepers counted out change (before the till took over!) Children will be taught to find the **difference** by counting on in the following ways.

533 – 187 =

Estimate : 530 – 190 = 340 (carried out mentally as 530 – 200 + 10 = 340)



#### 6. Towards standard vertical subtraction

When children are confident in finding the difference between larger numbers using number lines, they will begin to be introduced to a more efficient vertical procedure.



This first vertical method is again based on counting up.



#### 7. Subtraction by decomposition

Children will then be shown decomposition; they must really understand place value to do this.

83 - 55 is the same as	80 + 3 50 + 5	Ten is taken from 80 and added to the three.		
This can be rewritten as	70 + 13 $50 + 5$ $20 + 8 = 28$		A hundred is taken from 500 and added to 20.	
533 - 187 is the same as	500 + 30 + 3 -100 + 80 + 7	500 + 20 + 2 - <u>100 + 80 +</u>	13 7	
A hundred now needs to be	e moved as well.	400 + 120 + - 100 + 80 - 300 + 40 +	13 + 7 6 = 346	

# Subtraction continued...

 $\begin{array}{c} \mathbf{533} \\ \underline{-187} \\ 100 \\ 100 \\ 80 \\ + \\ 7 \end{array} = \begin{array}{c} 500 \\ 500 \\ 100 \\ 80 \\ + \\ 7 \end{array} = \begin{array}{c} 500 \\ 100 \\ 80 \\ + \\ 7 \end{array} = \begin{array}{c} 400 \\ 100 \\ 100 \\ 80 \\ + \\ 7 \end{array} = \begin{array}{c} 346 \\ 100 \\ 80 \\ + \\ 7 \end{array}$ 



#### 8. Subtraction by decomposition

Only when children are completely secure in this we will teach them standard vertical subtraction using decomposition.

<sup>4</sup>,<sup>12</sup>,<sup>1</sup> 5,3,3 -187 346

Not all children will ever reach this stage.

# Multiplication

**1. Practical Multiplication** - 2 x 4 2 lots of 4.





2. Use of arrays 4 x 5 This is an array.



3. Repeated addition

4 x 5 =

5 + 5 + 5 + 5 = 20

or 4 + 4 + 4 + 4 + 4 = 20

4. Repeated addition can also be done on a number line.
4 x 5



5. Partitioning – Simple recording

 $17 \times 3 = (10 \times 3) + (7 \times 3)$ 30 + 21 = 51





Number lines can be used to do the addition part!

4. The Grid Method This is our key strategy for beginning to formally record multiplication. 17 x 3 = (10 x 3) + (7 x 3)

 X
 10
 7

 3
 **30 21**

30 + 21 = 51

Add the numbers inside the grid together to get the answer.



5. Multiplying two 2 digit numbers 18 x 23 Estimate 20 x 20 = 400. Try to add the numbers together mentally. If not, use a written method.

Х	10	8
20	200	160
3	30	24

200 + 160 + 30 + 24 = 360 + 54 360 + 54 = 414

	360			
+	54			
	4			
	110			
	300			
	414			

6. 3 digit by 2 digit 156 x 25 = Estimate 160 x 20 = 3200



3120 + 780
3900
1

7. 3 digit by 3 digit 152 x 385 Estimate 150 x 400 = 60000.

X	100	50	2	S. J. A.
300	30000	15000	600	45 600 + 12 160
80	8000	4000	160	<u>760</u> 58 520
5	500	250	10	11

8. Once children are confident with the grid method, they will be introduced to the following strategies for recording. Short multiplication

x	17 3	
_	21 30	(7x3) (10 x 3)
	51	



9. Long multiplication  $184 \times 32$ Estimate  $180 \times 30 = 5400$ .

17 x 3



# Division

1. Sharing or Grouping – Division is initially represented pictorially.

6 ÷2 = 3

6 sweets **shared** between 2 people. How many each?



Sharing and grouping are two totally different concepts that children need to understand. There are 6 people in a room. Put them into **groups** of 2. How many groups can you make?

#### 2. Using a number line to show division.



21 ÷7 = 3

# Division cont .....

#### 3. Using Multiples of the Divisor - Chunking.



 90 50	(10 x 5)
 40 40	( <mark>8</mark> x 5)
0	

Start with 90 and take away multiples of 5.

4. Short division

87÷4 = 21 r 3



## Division cont .....

5. Using Chunking with larger numbers.

#### 875÷24 = 36 r 11



6. Leading to sums using decimals.

### Remember what is important in maths!

- A focus on mental calculations.
- The ability to **estimate**.
- To use maths in a real life context.
- To ask children to explain how they have calculated something using a method that suits them.
- Teach children written calculations, but only when children are ready.

