St David's C of E Primary School

Parents Booklet

Written Methods of Calculations

(Years 3 and 4)

Do your children ask for help with their maths homework and start using words like 'partitioning', 'arrays', 'grid multiplication', 'expanded column addition'....? The purpose of this booklet is to outline the various calculation methods that children are taught, many of which look different to the methods that you may have been taught in your school days.

We hope the explanations and examples of strategies will help you to assist your child at home.

A lot of emphasis in mathematics teaching is placed on using mental calculations where possible, using jottings to help assist thinking. As children progress through St David's, and are taught more formal written methods, they are still encouraged to think about what mental strategies they could use first and only use written methods for those calculations they cannot solve in their heads.

It is important to encourage children to look first at the problem and then get them to decide which is the best method to choose - pictures, mental calculations with or without jottings, structured written methods or calculator.

When faced with a calculation problem, encourage your child to ask:

Can I do this in my head?

Do I need to use a written method?

Should I do this in my head, using drawings or jottings to help me?

Addition

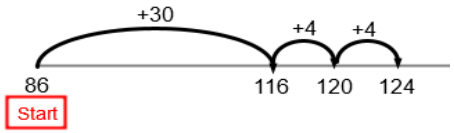
Year 3

Counting on

Why use a number line?

It helps me to show on paper what is going on in my head.

T U + T U
8 6 + 3 8 = 124

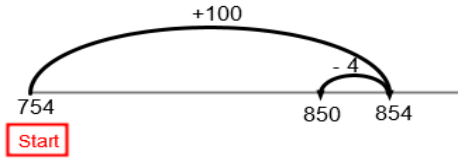


Compensation

Why are you subtracting when you should be adding?

I noticed that 96 is closer to 100. 100 is easier to add than 96, then I just subtract 4.

H T U + T U
7 5 4 + 9 6 = 850



Expanded informal method using partitioning

Why are you adding units first?

I need to practise adding units first because the next method works this way.

HTU
435 = 400 + 30 + 5
+248 = 200 + 40 + 8
683 = 600 + 70 + 13

Year 4

Expanded Column method

Why do you say 80+70 instead of 8+7?

I need to remember the value of each digit so I know the size of the numbers I am adding. I need to understand what I am doing and not learn a trick.

2327 + 542 = 2869

TH	H	T	U
2	3	2	7
+	5	4	2
		9	
	6	0	
8	0	0	
2	0	0	0
2	8	6	9

2384 + 576 = 2960

TH	H	T	U
2	3	8	4
+	5	7	6
		1	0
	1	5	0
8	0	0	
2	0	0	0
2	9	6	0

Standard Compact method

I recognise this method.

I must remember to line the numbers up in the correct columns.

587 + 475 = 1062

TH	H	T	U
	5	8	7
+	4	7	5
1	0	6	2
	1	1	

Place the 2 in the units column and carry the 10 forward to the tens column.

500+400=900 then +100 which totals 1000. Place this is the hundreds column.

80+70=150 then +the 10 which total 160. Place 60 in the tens column and carry the 100 forward into the hundreds column.

Subtraction

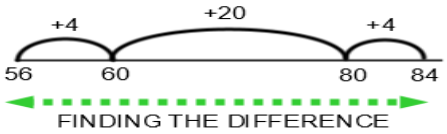
Year 3

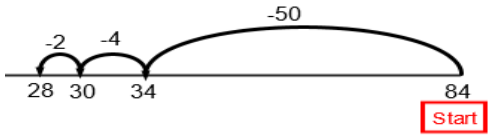
Year 4

Counting on or back

How do you decide whether to count on or count back?

If the numbers are close together like 213-198, its quicker to count on. If the numbers are a long way apart like 203-5, its quicker to take away.



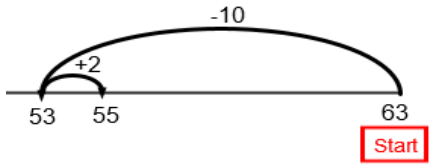


Compensation

Why are you adding when you should be subtracting?

I noticed that 8 is closer to 10 and 10 is easier to subtract than 8, then just add 2.

T U - T U
6 3 - 8 = 55



Expanded informal method using partitioning

How does partitioning help you?

We partition into their HTU parts, so we can do easier calculations.

367 - 124 = 243

TH	H	T	U		
	3	6	7	=	300 + 60 + 7
-	1	2	4	=	- 100 + 20 + 4
	2	4	3	=	200 + 40 + 3

Expanded informal method

Why do you say 50 instead of 5?

I need to remember the value of each digit so I know the size of the numbers I am adding. I need to understand what I am doing and not learn a trick.

754 - 286 = 468

TH	H	T	U		
	7	5	4	=	700 + 50 + 4
-	2	8	6	=	- 200 + 80 + 6

40 1

600 1

700 + 40 + 14

- 200 + 80 + 6

600 + 140 + 14

- 200 + 80 + 6

468 = 400 + 60 + 8

Standard Compact method

I recognise this method.

Using the previous methods first, now helps me to understand this method.

H T U

6 14 1

7 5 4

- 2 8 6

4 6 8

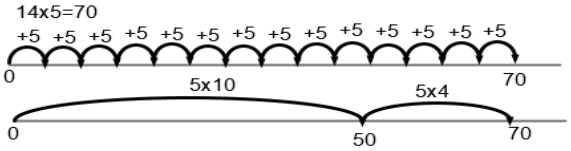
Multiplication

Year 3

Number line

How is multiplication the same as repeated addition?

The number line helps me see each group of 5 clearly.

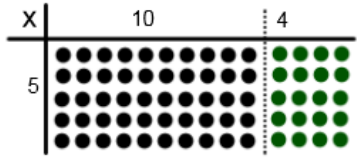


Partitioning as Arrays (using the Distributive Law)

Isn't this time consuming?

This helps me when I move onto the grid method of multiplication.

14 x 5 = (10x5) + (4x5) = 50 + 20 = 70



Grid Method

Why do you partition the numbers?

It doesn't take long. I can see what I have to multiply very easily.

23 x 8 = 184

X	20	3	
8	160	24	=184

Year 4

Grid method

You've got to do lots of calculations. Don't you get confused?

The layout of the grid helps me organise what I have to do.

46 x 32 = 1472

X	40	6	
30	1200	180	= 1380
2	80	12	=+ 92
			1472

Expanded Column method

What are the brackets for?

They remind me which numbers I am multiplying. I also have to remember to line the numbers up as HTU.

23 x 8 = 184

```
 H T U
   2 3
 x   8
 1 6 0   (20x8)
   2 4   (3x8)
 1 8 4
```

Standard Compact method

Why do you multiply the units first?

I multiply the units first so I can carry forward any tens I need to.

23 x 8 = 184

```
 H T U
   2 3
 x   8
 1 8 4
   2
```

2 is the two tens that need to be carried forward. I have to remember to add this on.

Division

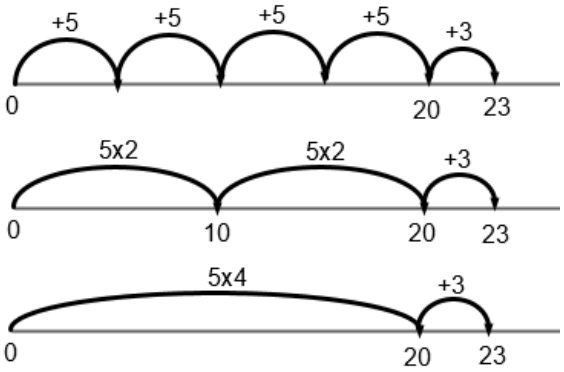
Year 3

Number line (chunking)

I've never heard of chunking before. How does this help you?

I can use my known multiplication facts to help me with division.

23 ÷ 5 = 4 r3



Inverse Operations

How does knowing the times tables help you with dividing?

Knowing my times tables and known number facts can help me when dividing.

26 ÷ 2 = **13** (2 x **13** = 26)

24 ÷ **2** = 12 (12 x **2** = 24)

80 ÷ 10 = 8 (8 x 10 = **80**)

Year 4

This looks very complicated?

I look for chunks of 10 first. If I take bigger chunks it makes the calculation quicker and easier. This will help me to understand the short compact method I will be using in year 5 and 6.

96 ÷ 6=16

6) 96
- 60 (10x)
36
-36 (6x)
0 16 answer

72 ÷ 3=24

3) 72
- 30 (10x)
42
-30 (10x)
12
- 6 (2x)
6
- 6 (2x)
0 24 answer