Supporting Learning

Calculation in Maths

Explaining the different stages of calculation

Dear Parents,

We are always trying to find different ways to help your children progress at school and at home. This booklet informs you about the calculation methods that are taught at North Nibley C of E Primary School. Please encourage your child to use these methods to reach their answers as the methods provide crucial foundation stones for their later education and understanding of mathematics.

Confidence is a key factor in progress for children and they need accurate support to develop this and not be hindered by confusion or mixed vocabulary or strategies.

The booklet shows a progression with a strong emphasis on mental and written methods. To support their learning at home, your child should use the strategy that they use in their classroom, please allow them to try and teach you their methods. When they have a secure understanding, your child's teacher will introduce an extension of each operation. It is important that they feel happy and confident in the methods they use, underpinned by a secure knowledge of tables.

To further support the learning we are preparing videos, where children demonstrate how to complete different calculations. These videos will be available from 2013 onwards and found here - http://www.northnibley.gloucs.sch.uk/p_Calculation.ikml

This booklet can be used to support numeracy homework or any additional maths learning you may chose to focus on. If you would like example calculations, specific to your child's needs, their class teacher would be happy to help. We hope that these booklets give guidance and support to all ages.

Yours sincerely,

Mr. Tomkins

Addition

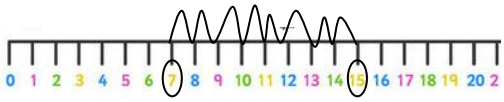
Also known as: add, addition, more, plus, increase, sum, total, altogether, how many more.

Method

Using number lines or 100 squares to help you

Example

7 + 8 =



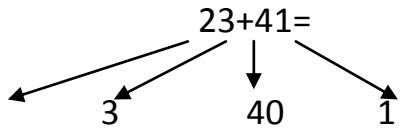
(start at 7 count on 8)

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

Children can also use this to bridge tens.

Eg. 46 + 23

Method	**Example**
Counting on from the biggest number.	5 + 3 = (in your head start at 5 and say 6,7,8) 5 + 3 = 8

Method	**Example**
Partitioning (Splitting the number up into small parts, thus making it easier to find the answer)	23+41=  (you add the units first and the tens after) 1 + 3 = 4 20 + 40 = 60 60 + 4 = 64 23 +41 = 64

Method	**Example**
Add and adjust (technique for adding 8 or 9 to a number)	79 + 9 = Round the 9 to 10 (for ease) 79 + **10** = 89 89**—1** = 88 -1 from the total (remove the 'extra' 1)

Method	**Example**
Column Addition	Partitioning larger numbers. (The words you use are crucial to the understanding... in this sum, "the tens column is 50 + 70 = 120" **not "5 + 7 = 12 so carry the one"** E.g. 358 + 273 = 3 5 8 + 2 7 3 1 1 (8 + 3) Add the units first 1 2 0 (50 + 70) 5 0 0 (300 + 200) 6 3 1 **When confident, you can stop using the brackets.**

Method	**Example**
The Standard Written Method **(Again, please be careful with vocabulary..."you are carrying over one ten and hundred" in this calculation)**	358 + 273 = 3 5 8 + 2 7 3 6 3 1 1 1

Method	**Example**
The Standard Written Method (with decimals)	(It is of vital importance to place the same value of each number above each one). E.g. 124.9 + 117.25 = 1 2 4 . 9 **0** Write the 0 to help you! + 1 1 7 . 2 5 2 4 2 . 1 5 1 1

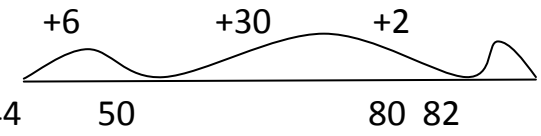
Subtraction

(The simplest way of working out subtraction initially is to actually count on, not backwards!)

Also known as: subtract, take away, minus, decrease, leave, how many are left over, difference,

Method	**Example**
Counting On	7 – 3= Put the smallest number in your head (3) **Count on** to the largest number using your fingers (4,5,6,7) . How many fingers are you holding up? That's your answer! 7–3 = 4

Method	**Example**
Counting Back	12 – 8 = Put the largest number in your head (12) **Count back** to the largest number using your fingers (11,10,9,8,7,6,5,4) . What have you counted down to? 12 – 8 = 4

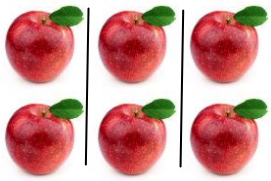
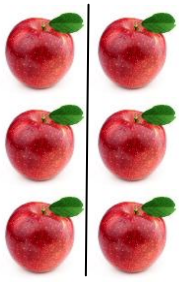
Method	**Example**
Counting on using a number line.	eg. 82 - 44 =  **Count on** in sensible jumps that the child can handle accurately. Find the total of the jumps. 30 + 6 + 2 = 38

Method	**Example**
Column Subtraction. Please be very careful with the vocabulary you use with your children. (There is no need to 'borrow', since the first number is larger and 'sufficient'. We 'break down' a ten into units. We also emphasis the value of each digit, e.g. say twenty and not two when working in the 'tens' column.	376 – 127 = $3^{6}\cancel{7}^{1}6$ (Largest number on top!) (300 + 60 + 16 = 376) - 1 2 7 2 4 9 With Decimals 9.514 – 1.6 $^{8}\cancel{9}.^{1}\cancel{5}14$ - 1. 600 7. 914
You should always check subtraction answers by **reversing them**... so does 249 + 127 = 376?	

Multiplication

Also known as: lots of, groups of, times, product, multiply, multiplied multiple of, once, twice, three times, four times, five times, … times, repeated addition, array, double

Method	**Example**
Repeated addition	3 x 6 will be worked out by adding 6, three times: 3 x 6 = 6 + 6 + 6 Or 6 x 3 = 3 + 3 + 3 + 3 + 3 + 3

Method	**Example**
Arrays – using images/ objects / quantities to learn multiplication.	3 x 2  2 x 3 

Method	**Example**
Partitioning – Multiply the tens then multiply the units. Add them together.	26 x 8 20 x 8 = 160 6 x 8 = 48+ 208 1

Method	**Example**
Grid Method	26 x 8 = X | 20 | 6 8 | 160 | 48 = 208

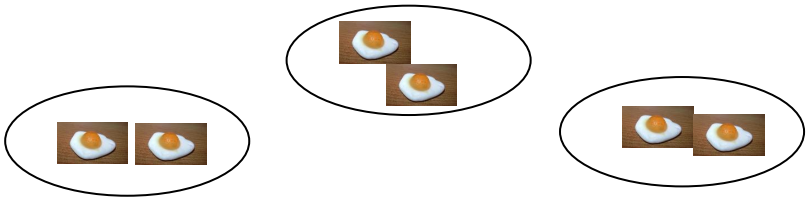
Method	**Example**
Extended Grid Method	24 x 35 X | 20 | 4 30 | 600 | 120 =720 5 | 100 | 20 =120 720 + 120 = 840

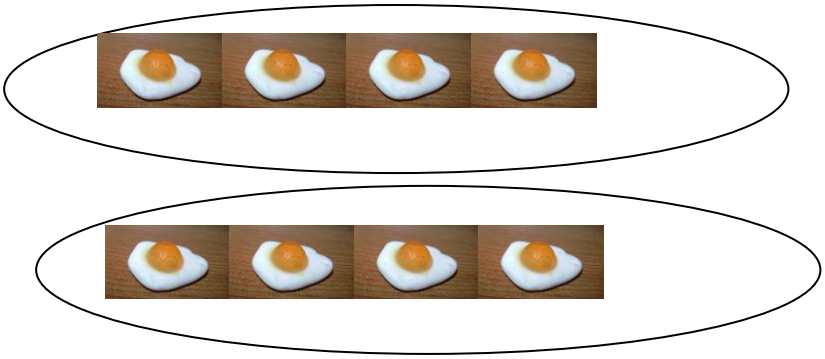
Method	**Example**
The Vertical Method	56 x 7 = 56 x 7 350 (50 x 7) 42 (6 x7) 392

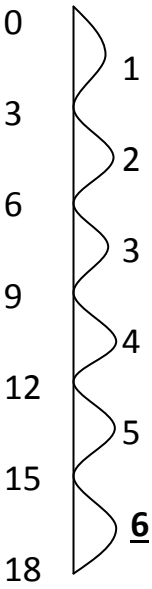
Method	**Example**
Short Multiplication	38 x 7 38 x 7 266 5

Division

Also known as:
halve, share equally, one each, two each, three each…, grouping, equal groups of, divide, divided by, divided, divisible by,

Method	**Example**
Grouping Taking a visual and or tactile approach is one of the first ways in understanding division.	6 ÷ 2 = (How many even groups of 2 can we place the 6 eggs in to?) 

Method	**Example**
Putting into groups of … Taking a visual and or tactile approach is one of the first ways in understanding division.	8 ÷ 2 = (8 sweets **shared** between 2 groups gives each group...)  8 ÷ 2 = 4 Use inverse rules to check: does 4 x 2 = 8?

Method Vertical Number Line (How many 'jumps' of 3 make 18?)	**Example** 18 ÷ 3 =  18 ÷ 3 = 6

Method Chunking	**Example** 48 ÷ 4 = 48 -40 (4 x **10**) 8 - 8 (4 x **2**) So 48 ÷ 8 = 12 --- Remainders 57 ÷ 5 = 57 -50 (5 x **10**) 7 - 5 (5 x **1**) 2 (This is the remaining number that is left over) So 57 ÷ 5 = 11 r 2

Method	**Example**
Short Division	224 ÷ 7 $7\overline{)2^{2}2^{1}4}$ 32

Method	**Example**
Long Division NB. If children have a sound understanding of the principles that underpin division with larger numbers it may be helpful to move straight to short division.	768 ÷ 32 $32\overline{)768}$ 2 64 (this represents 32 x 6 that is already placed on the calculation) $32\overline{)768}$ 2 -64 12 (32 does not go into 12 so we bring down the 8 from the units column to create 128.) $32\overline{)76}$ 2 -64 12**8** (Use trial and error or your 32 times table to work out how many times 32 goes in to 128) 32 x 4 = 128 (the 4 now goes in to our calculation to give us the final answer) $32\overline{)76}$ 24 -64 128 768 ÷ 32 = 24