

## Information for parents about calculation strategies

In response to requests from parents here is a summary of how we teach calculation to our pupils, the vocabulary that we use and how children progress as they develop their calculation strategies.

### A glossary of terms

Numeral	The written representation of a number eg 1 2 3 4 5 6 7 8 9.
Digit	Each numeral eg 23 is a 2 digit number, 342 is a 3 digit number.
Place value	The value of each digit is defined by its place eg in 23 the 2 represents 2 lots of 10, and the 3 is 3 ones (or units)
Number bonds	These are numbers which bond together to make another number eg number bonds to 10 include $1 + 9$ , $2 + 8$ , $3 + 7$ , $4 + 6$ .
Partitioning	At Key Stage 1 we partition numbers into tens and units eg 35 can be partitioned into 30 and 5. We can extend this to partition into hundreds, tens and units eg 179 can be partitioned into 100 and 70 and 9. Sometimes we describe partitioning as exploding a number.

The mathematical journey through our school begins in Foundation Stage with lots of opportunities to count in a practical context, to practice taking away ( eg I have 6 grapes and I eat 2, how many now?), adding (eg I buy 4 more grapes, how many now?), sharing (eg 2 people want to share 8 grapes) and multiplying (3 people have 2 grapes each). Children begin to represent their calculations using their own methods and are introduced to standard methods of recording when appropriate. Children need to have many opportunities to practice calculating with actual objects before they are ready to record using numerals and symbols for calculation. You will notice that when children begin to add sets they will start by counting all the objects before they develop the skill of being able to count on eg I have 4 bears and 3 more arrive, how many now? Children begin by counting all of them, even if they have established that there are 4 to start with, they will go back to 1. As they develop mathematically they will know that there are 4 and count on from 4 to 7.

As children enter the national curriculum in KS1 they begin to record their work using standard notation symbols. When we talk to children about calculation we use a wide variety of terms:-

**Addition**, add, plus, altogether, and

**Subtraction**, subtract, takeaway, minus, less

**Multiplication**, times, sets of, groups of

**Division**, sharing

**Equals**, total, sum of, makes, altogether

They key to becoming numerate is to have a clear understanding of the pattern in numbers and the value of each digit. Becoming familiar with the pattern of numbers in a 100 square is an important part of becoming confident at calculations.

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

The pattern in numbers is always surprising. Pick a number. Add the numbers on each side of it. What do you notice? What about if you add the numbers above and below a number? What do you notice? How many places can you find the pattern 1-9? Where are all the 5s in this grid? Use the grid as a calculator. Pick a number. Add 10. (All you have to do is to jump down one row.) Try this calculation:  $36 + 24$ . Start on 36. Jump down 2 rows to add 20, then count along in ones to add 4. We want children to understand the pattern in numbers.

Children need to be able to partition numbers to calculate. We usually do not teach column addition and subtraction at Key Stage 1 because children need to understand the value of the digits, and to be confident at partitioning. If we teach them calculation tricks they might be able to get the correct answer, but will not understand why. So, first comes the understanding, then comes the quick calculation method.

We use a variety of strategies for addition. Here is one of the methods that we use to add in ones:

**Step 1:** Adding in Ones

$$34 + 7 =$$

Don't forget to write the number sentence!

34

(Biggest number goes here)

**Step 2:** Adding in Ones

$$34 + 7 =$$

34 35

Begin to add on the ones

**Step 3:** Adding in Ones

$$34 + 7 =$$

34 35 36 37 38 39 40 41

Now add the rest of the ones!

**Step 4:** Adding in Ones

$$34 + 7 = 41$$

Finally record the answer!

34 35 36 37 38 39 40 41

Look at where you have landed!

By the end of Year 2 children will have been taught to add pairs of 2 digit numbers using this method:

**Step 1: Addition**

$$\begin{array}{r} 34 + 28 = \\ \underline{\phantom{34}} \\ 20 \phantom{8} \\ \phantom{20} 8 \end{array}$$

(Remember you can explode the number)

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34

(Biggest number goes here)

**Step 2: Addition**

$$\begin{array}{r} 34 + 28 = \\ \underline{\phantom{34}} \\ 20 \phantom{8} \\ \phantom{20} 8 \end{array}$$


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34    44    54

(Now add your tens.)

**Step 3: Addition**

$$\begin{array}{r} 34 + 28 = \\ \underline{\phantom{34}} \\ 20 \phantom{8} \\ \phantom{20} 8 \end{array}$$


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34    44    54    59    62

(Now you can add your units. Remember you can do this in more than one jump if you want to.)

**Step 4: Addition**

$$\begin{array}{r} 34 + 28 = 62 \\ \underline{\phantom{34}} \\ 20 \phantom{8} \\ \phantom{20} 8 \end{array}$$

(Remember to write your answer here.)

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34    44    54    59    62

(Look here to find your final answer.)

**Extra Step: Addition**

$$\begin{array}{r} 34 + 28 = 62 \\ \underline{\phantom{34}} \\ 20 \phantom{8} \\ \phantom{20} 8 \end{array}$$


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34    44    54    59    62

(When you are confident you can make your jumps bigger. It means less jumps if you do.)

You can see that this method can easily be adapted for subtraction.

Teaching children to calculate using the 100 square is very important for their understanding of the pattern in numbers and place value. For example, if we are adding 15 to 23, we would start on 23 (the largest number), partition 15 into 10 and 5, then add 10 to 23 by jumping down 1 square to 33, then count along in 1's to reach 38.

The booklet called Parents Guide – Help your Child with Numbers has been given to all Key Stage 1 parents and is a useful resource for ideas to support your child at home, as well as giving an indication of the expectations at the end of each year. Do remember that we are all different, and some children's understanding of mathematics develops a little faster than others. It is very important that at every stage children perceive themselves as mathematicians and enjoy working with numbers.

Listed below are some maths websites which support the curriculum.

<http://www.bbc.co.uk/schools/numbertime/>

<http://www.ictgames.com/100hunt2.html>

<http://mathszone.co.uk/>