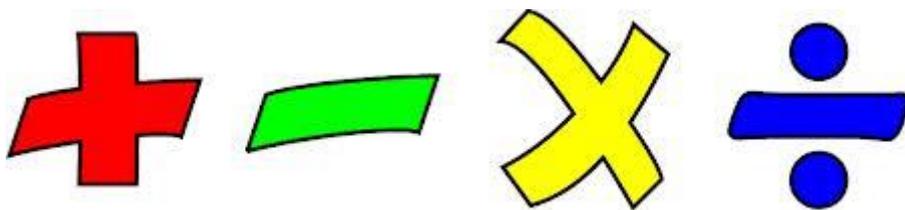*Together Towards Excellence*

St. Werburgh's

Primary School

Calculation Policy

Calculations

Mathematics will be at the core of your child's schooling from the moment they start to the moment they leave. They will be involved in drawing, measuring, handling data and lots of other practical activities that will help your child to understand and enjoy the subject. This booklet offers guidance to the methods used to help our pupils with calculations. The methods we are advocating are in line with the Curriculum (September 2014). We hope this will be helpful to you and that you will be able to support your child in learning by heart the basic rules which will assist in mental recall eg. number bonds and multiplication tables.

The methods that we use in school may or may not be familiar to you. Children are often confused when they ask parents for help at home and they try to teach the methods that they themselves were taught. Knowing how the methods in this booklet work will help you to help your children.

All staff in school work from this document so that we can ensure the consistency of our approach and can make sure that the children move onto the next step when they are ready.

The four operations that are covered by this booklet are addition, subtraction, multiplication and division. Whichever operation is being taught the child needs to experience all of these steps to completely conquer it.

1) using objects

2) using pictures

3) using a numberline

4) using an expanded method

5) using a compact written method

Mental methods first

Children should always be encouraged to consider if a mental calculation would be appropriate before using written methods. – These are covered in the first part of each section.

Why children need to do written calculations

- To represent work that has been done practically.
- To support, record and explain mental calculation
- To keep track of steps in a longer task
- To work out calculations that are too difficult to do mentally

Children should be taught when it is appropriate to do an approximate or estimate first and should check with the inverse operation at the end.

By upper Key Stage 2 (years 5 and 6), children should be confident in choosing and using a strategy that they know will get them to the correct answer as efficiently as possible.

What parents can do to help

- Count with your child
- Play number games
- Involve children when taking measurements or weighing items
- Take note of numbers in real life e.g. telephone numbers, bus numbers, lottery numbers etc.
- Give children opportunities to use money to shop, check change etc.
- Talk about the mathematics in football e.g. 'How many points does your favourite team need to catch the next team in the league?'
- When helping children calculate use the method that they have been taught

Things to watch out for that may be different...

- When multiplying by 10 you do not just 'add zero' - you 'move the digits to the left and add a zero as a place holder'

- The decimal point cannot move - You can only move the digits to the left or to the right

- We do not do 'sums' – 'sum' is a mathematical word that means 'addition', everything else is a 'calculation'

Glossary

2-digit – a number with 2 digits like 23, 45, 12 or 60

3-digit – a number with 3 digits like 123, 542, 903 or 561

Addition facts – knowing that 1+1 = 2 and 1+3 = 4 and 2+5 = 7. Normally we only talk about number facts with totals of 20 and under.

Array -An array is an arrangement of a set of numbers or objects in rows and columns –it is mostly used to show how you can group objects for repeated addition or subtraction.

Bridge to ten – a strategy when using numberlines. Adding a number that takes you to the next 'tens' number.

Bus Stop Method - traditional method for division with a single digit divisor

Concrete apparatus – objects to help children count – these are most often cubes (multilink) but can be anything they can hold and move. Dienes (purple hundreds, tens and units blocks), Numicon, Cuisenaire rods are also referred to as concrete apparatus.

Column chunking – method of division involving taking chunks or groups or the divisor away from the larger number

Commutative – when multiplying it doesn't matter which order you multiply in, you still get the same answer. Eg 3 x 4 = 12 and 4 x 3 = 12.

Decimal number – a number with a decimal point

Divisor – the smaller number in a division calculation. The number in each group for chunking.

Double – multiply a number by 2

Exchanging – Moving a 'ten' or a 'hundred' from its column into the next column and splitting it up into ten 'ones' (or 'units') or ten 'tens' and putting it into a different column

Expanded Multiplication – a method for multiplication where each stage is written down and then added up at the end in a column

Find the difference – A method for subtraction involving counting up from the smaller to the larger number

Grid method – a method for multiplying two numbers together involving partitioning

Half - a number, shape or quantity divided into 2 equal parts

Halve – divide a number by 2

Integer - a number with no decimal point

Inverse – the opposite operation. Addition is the inverse of subtraction, multiplication is the inverse of division

Long Multiplication – column multiplication where only the significant figures are noted

Number bonds to ten – 2 numbers that add together to make ten, like 2 and 8, or 6 and 4.

Number bonds to 100 – 2 numbers that add together to make 100 like 20 and 80, or 45 and 65 or 12 and 88

Numberline – a line either with numbers or without (a blank numberline). Children use this tool to help them count on for addition of subtraction and also in multiplication and division.

Numberline Chunking - method of division involving taking chunks or groups or the divisor away from the larger number

Number sentence – writing out a calculation with just the numbers in a line E.G. 2+4=6 or 35 ÷7 = 5 or 12 x 3 =36 or 32 – 5 = 27

Partition – split up a larger number into the hundreds, tens and units. E.G. 342 – 300 and 40 and 2

Place Value – knowing that in the number 342 – the '3' means '3 hundreds', the '4' means '4 tens' and the '2' means '2'.

Quarter - a number, shape or quantity divided into 4 equal parts

Recombine – for addition, once you have partitioned numbers into hundreds, tens and units then you have to add then hundreds together, then add the tens to that total, then add the units to that total

Remainder – a whole number left over after a division calculation

Repeated addition – repeatedly adding groups of the same size for multiplication

Significant digit – the digit in a number with the largest value. E.G in 34 – the most significant digit is the 3, as it has a value of '30' and the '4' only has a value of '4'

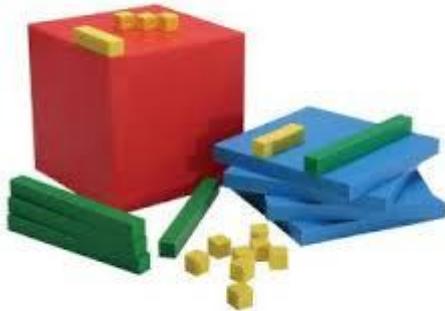**Single digit** – a number with only one digit. These are always less than 10.

Taking away – a method for subtraction involving counting backwards from the larger to the smaller number

Tens number - a number in the ten times tables – 10,20,30,40 50,etc.

Unit – another term for single digit numbers. The right hand column in column methods is the 'units' column
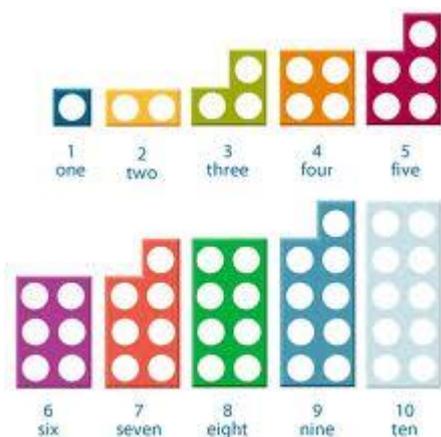
Resources

Dienes

Dienes, although it has been used in schools for years is a crucial step in understanding place value. They help us to know what a 'one' (unit), a ten, a hundred and a thousand look like and how they can be added together and split up to form smaller and larger numbers.
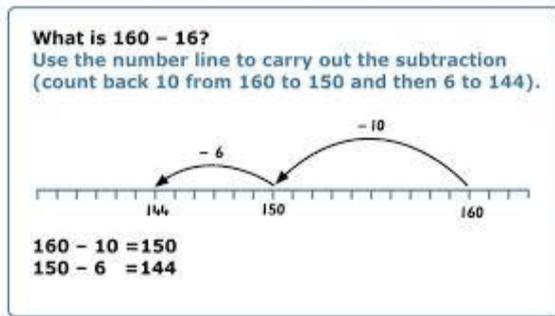
Cuisenaire Rods and a number track

Although these little rods can represent integers from 1 to 10, they can be used for a range of aspects of maths. We normally use them for multiplication and division or ratio and proportion. They are also really useful for addition.

Numicon

Numicon is an especially useful resource as it can be used for teaching all four operations as well as fractions, decimals, percentages and a range of other aspects of maths. Each piece represents an integer from 1 to 10. The children love using it as it is colourful and tactile

Numberlines

What is 160 – 16?
Use the number line to carry out the subtraction
(count back 10 from 160 to 150 and then 6 to 144).

160 – 10 = 150
150 – 6 = 144

Numberlines are a mainstay of teaching calculations. We have pre numbered and blank numberlines in school that children can write on, or they can draw their own as appropriate for the calculation.

Place value counters

These are used in a similar way to dienes, although should not be used until children have a firm understanding of the relationship between hundreds, tens and units. These are used to support children carry out all 4 operations.