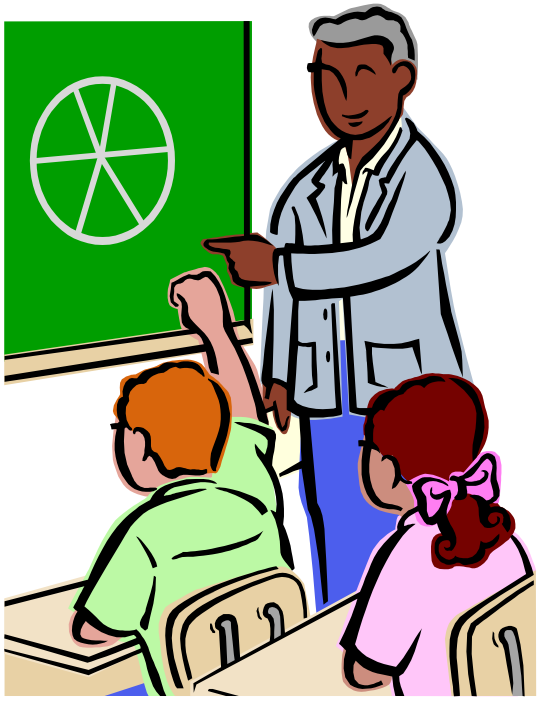
Teaching Numeracy

at Muxton Primary School



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The emphasis at Key Stage One is on practical experiences that develop the children's mental ability to work with numbers. Also teachers spend a great deal of time introducing mathematical vocabulary and encouraging the children to use it themselves. It is important that the children understand what each digit is worth and its place in the number system. As the children progress they will begin to see calculations written down, first modelled by their teachers, then by having a go themselves. This approach means that children do not record at every lesson. So there may not always be lots to see in their books, but this should not be a concern at this stage, as the children are learning a great deal through hands on activities and oral work. As children move into Key Stage 2 there is still an emphasis on mental calculations but the children are gradually introduced to more formal written methods of recording.

All the children cover work on shape, space , measures and data, as well as number. The amount of work that they cover is too vast to cover in a leaflet but as the most frequently asked questions by parents are about how we teach calculation strategies (addition, subtraction, multiplication and division) this will be the focus of the leaflet. If after reading this leaflet you would still like to know more please speak to your child's teacher.

All children at Muxton, right from year one, are encouraged to make decisions about their calculations so that they choose the most appropriate and reliable method. The following sheet forms part of our approach here at Muxton, following the guidelines of the National Numeracy Strategy. All children are encouraged to go through the checklist (at the bottom of the sheet), before tackling any calculation.

Encouraging decision making in children's mathematics

Children need to be encouraged into making decisions before tackling any calculation.

When approaching calculations children need to consider if their strategy is . . .

Appropriate

Reliable

Efficient

Children need to ask themselves a series of questions before tackling a calculation:

How can I solve this problem?

↓

Can I work out this calculation in my head?

↓

Can I work it out but need to do some jottings?

↓

Do I need to use counters, blocks or a number line to help (Key Stage 1)?

Is there a standard column method that would help (Key Stage 2)?

An Example of progression for one Key Objective
At Key Stage One

The following sheet takes one strand of the numeracy curriculum and demonstrates the progression that the children follow. It is vital that the children develop their skills and understanding at their own level and are not rushed on to the next step before they are ready as this can often lead to problems later on.

A major objective at Key Stage One is-

Children should be able to re-call the number that is 1 more/less, then 10 more/ less than any number to 20, progressing to 100. (by Year 2)

e.g 1 more than 64 1 less than 47

As children become more confident, these can be mixed up to ensure that they really understand the difference between more and less.

e.g 1 more than 52 1 less than 11

Then….

10 more than 25 10 less than 99

The next step is for children to begin to calculate addition and subtraction calculations with multiples of 10 up to 100….

e.g 30 + 40, 70 – 40, 10 plus 60, 60 minus 30,

….and then starting with 2 digit numbers with units….

e.g 46 add 30, 99 subtract 20, 64 – 20,

Now the children are secure in this knowledge and can confidently answer these calculations, they can move on to using near multiples of 10, e.g 11 and 9.

The children can use what they have learned previously to add/ subtract 10 then adjust e.g. 65 + 11=

65 + 10 + 1= 76

65 + 9=

65 + 10 – 1= 74

Final Challenge! Add/ subtract 21 from any 2 digit number. Then Add/subtract 19.

Teaching Calculation Strategies at Key Stage Two

As mentioned previously, the important work on mental calculation strategies continues in K.S. 2. Children are encouraged to solve calculations mentally first, but as their calculations become more challenging they move onto mental calculations with supportive jottings and then finally, when appropriate, a standard written method e.g vertical additon/ subtraction, long multiplication, division etc. **This final stage is only reached when all other strategies fail, ie the calculation is too difficult to use a reliable and efficient informal strategy!**

e.g. 7000 – 470 =
7000— 500 = 6500
6500 + 30 = 6530

It is more reliable and efficient to take away the 500, then add the 30 back on after.

Such calculations are much easier to do mentally, for some children in their head, or using informal jottings to help. These methods are much more reliable and less error prone than the standard written methods traditionally taught.

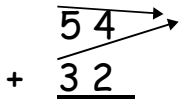
Commonly asked questions

Why are the children not encouraged to do column addition/ subtraction much earlier? Why do we so often see their calculations presented horizontally rather than vertically?

e.g 54 + 37 =
54 + 30 = 84
84 + 7 = 91

This is because we always want to encourage children to try a calculation mentally first rather than going straight into a standard written method. The above calculation is much simpler to do mentally. Previous place value experience from K.S.1 means that the children understand what each digit represents and can quickly total the tens then the units and find the answer.

Children who have only had calculations presented in a vertical layout often have little idea of the value of the digits and what they are actually doing mathematically. There is little understanding or mental ability involved.



These numbers may be read as 5 and 3 rather than 50 and 30

Such lack of understanding often causes problems later as the maths gets harder.

Another example is…. 999 + 637 = A child looking for the most efficient, appropriate and reliable method will quickly solve this

999 + 637 =

1000 + 637 = 1637 By making the 999 up to 1000 then taking the 1

1637 – 1 = 1636 back later this calculation is simple and solved in seconds. It demonstrates a sound understanding of all the digits and the maths involved. However, the traditional written method is much trickier and for some children very error prone.

That is why, although it is still important to have these vertical standard written methods, before we teach them we ensure that the children have a clear understanding of what they are actually doing and, more importantly, if there is a more efficient way of doing the calculation, to use that first.

If you would like to find out more about these approaches or have any questions please ask your class teacher or see Mrs Gallant (School Maths Co-ordinator).