

Maths is 'Method'

Stephen Curran tells us why so many children fail to succeed in mathematics.

I hated maths at school so I can speak from personal experience. As soon as I lost the thread of what was going on when entering secondary school, mild irritation soon turned to loathing. There are children who have a particular difficulty with numeracy, but most are of average ability. Therefore, the vast majority of children should be able to succeed to a reasonable level. So why do so many children fail to succeed in mathematics? It is simply a matter of how the subject is tackled. A sporadic and unstructured approach leads to confusion. Instead, I think a more traditional way allows numeracy to be learnt more thoroughly and quickly.

This traditional approach to teaching can be likened to building a house. First the foundations must be put in place, then the frame of the house, followed by the roof, windows and doors and finally the soft furnishings. Each part that is added is dependent on the previous part.

When teaching Key Stage One, I have, therefore, been content to work on the four rules of number, the learning of tables, number bonding and basic numeracy. I am preparing children in the basics of mathematics so they are ready for the structuring of their later mathematical thinking in a more systematic way.

When I came to the National Curriculum and faced teaching upper primary children mathematics I realised that the thinking behind it was flawed. Many distinct subject areas in maths were approached one after another in quick succession without any logical progression or links. I generally found real confusion in the children who were unable to grasp basic techniques. I believe in using whatever progressive methodologies work, but traditional teaching methods are best used for the basic skills and children respond positively to them.

The development and adaptation of traditional teaching structures provide the best framework for children's mathematical learning at upper primary level. This involves teaching the material in a logical order beginning with number, then decimals, followed by fractions and then percentages and ratios. When I decided to teach to a high level in each area rather than moving from subject to subject, I soon discovered that children began to grasp things more quickly and they stuck. Children love structure and respond readily to this building process.

There are certain recognisable points where the children would have difficulty, but instead of backing off and leaving the children on only level four, I pressed ahead. To my delight, I found that children would pass through these crisis points with a little bit of help and concentrated teaching. More importantly, I realised that, given half a chance, children could make the leap beyond the artificial boundaries we have put in place in the guise of National Curriculum levels. These levels seem to have become ways of categorising children rather than a means of making stepping stones across the syllabus.

My traditional approach focuses on success and that means teaching method. In fact I often say to children, "maths is method" and "maths without method leads to madness". If this were not the case I would not have so many parents, disenchanting by the National Curriculum, sending their children to me for maths tuition,

I believe in a traditional approach because it works. I discovered that many of the modern maths hooks do not appear to be systematic but are sporadically organised. This relates to the National Curriculum, which I believe encourages the teaching of maths by level rather than subject. Children that I teach privately who attend state primaries tend to have a piecemeal understanding of maths by the time they are nine or ten. Nothing appears to be covered comprehensively from beginning to end.

Children study number; then move to another subject like decimals. Then they may go to shapes and then back to decimals. They never seem to have really grasped any subject fully. I believe it is a mistake to expect children's understanding to go in tandem with their learning of method.

An excellent state primary teacher I know was recently explaining how children are currently taught to subtract when there are zeros at the top. It requires long explanations through which the child is supposed to

understand the process. He explained each stage in detail to the children. My response was: "Why not just teach them the method?". He said he couldn't do that, as they wouldn't understand it. I told him that teaching the method was sufficient and the understanding would drop in later anyway.

In the lower years it is important to concentrate on the four rules of number, mental arithmetic and tables, but I am convinced that children in upper primary need to be taught systematically. I don't do mental maths with my pupils either, except for insisting that they know their tables in a random fashion. If I ask a child "What is seven times eight?", he or she should be able to tell me without hesitation. I have now been working in this way for ten years and have seen hundreds of children succeed mathematically who were formerly written off by their schools and their teachers. I have found that parents have been delighted with the results. I encourage them to join their children at the end of my lessons each week. They often remark that it is the first time in their lives they have understood something. Many parents are terrified at the mention of maths and they immediately say they could never help their own children because they have no understanding themselves.

I am a child of the 'sixties and seventies' like them and I know what they mean. I can remember being completely baffled by maths lessons. As a child I wanted it to be organised and straightforward. I was continually given bits of information but nothing fitted together. All I remember was confusion and the growing belief that I was useless at maths and should concentrate my energies elsewhere. Consequently I am an arts graduate and English teacher by training. My need to teach maths however has helped me adopt what would now be seen as radical – a 'traditional approach'.

I am convinced that a traditional, structured approach works best. If you teach children a method, understanding will follow. Before you swamp them with information and detail, you have to organise their thinking. I am also strongly opposed to allowing children to use calculators before they have fully mastered number, decimals, fractions, percentages, ratios and so on. Having to work everything out on paper makes them more numerate.

When I became a teacher, I adopted a rigorously logical approach and that is how my maths books are organised. They are intended for children preparing to take Key Stage 2 tests, the 11-plus and common entrance exams for independent schools. The books cover each subject in turn: the first deals with basic number and decimals; the second with fractions and bases; the third with percentages and ratio; the fourth with lines and angles and shapes; the fifth with geometry, charts and graphs; and the sixth with algebra. By the time the children reach the end of book three, they begin to see the connections between decimals, fractions, percentages, ratios and probability, which is essential for any coherent understanding of maths.

Structured learning and a firm foundation are crucial. You cannot teach percentages successfully until children understand fractions. Algebra should be taught last, because it requires a comprehensive understanding of all the other maths covered at Key Stage 2. Each book is coded. First, there is mathematical information to be understood: "The tens number system is also called the denary system; single figures are termed digits; groups of digits are termed numbers.

Then there is mathematical technique to be mastered: "To multiply by 10 we add a 0, to multiply by 100 we add 00, to multiply by 1,000 we add 000. Suppose we have $100 \times 2,000$. Just count the total number of zeros and add them on – $100 \times 2,000 = 200,000$." Finally, there are lots of mathematical exercises to be practised (the answers are at the back). Each piece of knowledge builds into a complete whole and each section is complete within itself and contains everything a child needs to know up to National Curriculum Level 6.

Children must have their maths sorted out by the age of 11. After that, it is too late. As a secondary school teacher, I saw hundreds of pupils struggle when they made the transition from primary school. If they were innumerate and illiterate at 11, they would almost certainly fail GCSE at 16. Yet, many of them were intelligent and capable. The system had failed them. That is why a traditional teaching approach is so important in primary schools.

'11+ Maths' by Stephen Curran is available from Accelerated Education Publications (www.aepublicationsltd.co.uk) The books cost £4.99 each (plus p & p).