

## **Revision of Numeracy materials**

Anita Straker and Tim Coulson (TES, December 17<sup>th</sup>) outlined their plans for mathematics 'to unlock the doors to further improvements'. Key proposals include a 'sustained programme of professional development in primary mathematics' (including ICT) and a review of the framework for teaching from Reception to Year 6. The plans are encouraging.

One of the key difficulties Straker and Coulson highlight is that 'primary children still have difficulties with calculation methods, particularly compact written methods'. We believe that the cause of their difficulties is that young children seldom have opportunities to make links between their intuitive and informal methods and standard symbols in Foundation and Key Stage one. The Numeracy Strategy's publication *Teaching Written Calculations* emphasises the importance of this and offers some guidance – though it is much less clear on guidance to support children in Foundation and at the beginning of Key Stage 1, than for older children.

Teachers in Foundation and Year 1 understand the importance of helping children make connections with what they already know, understand and do, yet the lack of guidance for teachers on how they might support young children's own early 'written' mathematics and own written calculations has been lacking. It is vital that any reviews of the framework and training for teachers focuses now on evidence from research and the ways in which teachers can develop their practice.

Research we carried out with three hundred teachers of children 3 – 8 years into the teaching of written mathematics (2003) has highlighted some key findings including teachers' confusion about the pedagogy to support early written mathematics. It also points to concerns that continue to be raised by Ofsted, HMI and DfES about the teaching of written calculations.

For children, using and understanding the abstract symbols and standard written methods of mathematics are problematic from the start, since there are rarely opportunities for them to 'have plenty of experience of exploring their own individual ways of recording addition and subtraction activities before they begin to record more formally' (QCA, 1999, p.19). Our research has also shown that there is a significant absence of cognitive challenge in written mathematics for young children. And a growing body of research highlights the difficulties children experience with this important aspect of mathematics, difficulties that are likely to continue to confuse and undermine their understanding of written calculations as they move through school.

Our evidence is clear: adult-given worksheets or adult produced 'written mathematics' and calculations prevent young children in making sense of the standard, abstract written symbols and calculations. They deny them opportunities to 'translate' between their own mathematical graphics and abstract symbols – to 'bridge the gap' – so that they become bi-numerate.

We strongly recommend that the revision of the Numeracy materials illuminates young children's highly creative 'written' responses and the huge range of their mathematical representations. We also recommend that guidance be included on the pedagogy to support children's mathematical marks and representations: teachers will then be able to support children in exploring their mathematical thinking on paper in the deep and reflective ways highlighted in our research.

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