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### **Multiply the magic of maths**

It was great to read in the TES, (Letters, October 22nd) the call for mathematics to be not only useful, but 'a source of delight and wonder, offering pupils intellectual excitement'. However, for most teachers it appears that there is lack of clarity on how they might 'create a mathematical culture which embraces creativity'.

A recent study of children's experiences in Reception classes (Drummond & Moyles, 2004) highlighted a need for teachers to 're-examine the values and priorities of their approaches to numeracy teaching (p. 27) calling into question the limited value of certain aspects of teaching mathematics and emphasising ' the low level of cognitive demand' (p. 85).

A major new study of mathematics in the Early Years (EPPI: TES October 29th)) raises many questions concerning the way in which our youngest children experience mathematics - and the way in which it is taught. It points to an emphasis on 'teaching to the test' and teachers' difficulties that result in lessons that 'fail to challenge and extend the thinking of their pupils'.

Our research shows that teachers need clear guidance on how they might 'embrace creativity' and 'challenge and extend the thinking of pupils'. One significant study we carried out has highlighted ways in which children in Foundation and KS1 can engage in deep levels of thinking about mathematics. It shows the tremendous range of creative responses children use as they develop understanding of written calculations and explore abstract symbols. We have also explored the pedagogy that supports such deep mathematical thinking. Our research has uncovered huge misunderstandings and the difficulties teachers face concerning the existing guidance for teaching written calculations in Foundation stage and in KS1. Rich, deep and creative children's thinking about mathematics is sorely needed.

Our current research focuses on teachers' beliefs about creativity in mathematics. It shows that mathematical creativity is seen only in terms of symmetrical 'butterfly' prints, making patterns with blocks or playing in the sand: whilst these all have an important role to play in early education they do not guarantee deep levels of thinking about mathematics. The director of the national Primary Strategy points to the 'catch-up' sessions that have now been introduced for children who are low achievers - but it is important to ask why they might be achieving at a low level from such an early age. The forthcoming EPPI report calls also for in-service training for teachers: this may be just what is needed - unless all that is offered is more of the same.

What is clear is that young children urgently need a new vision to support their learning in mathematics.

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