

## Comments on the Draft National Curriculum for Mathematics Key Stages 1 & 2

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I have not commented on details of the proposals but only on major features. However it should be noted that there are a number of discrepancies and inconsistencies within the content lists.

### **Comments:**

- 1) *Aims* We largely agree with the purposes and aims stated in the introductory matter (with the exception of the statement which has clearly been inserted later into the final paragraph of aims that 'Pupils should therefore be taught to practise and then apply their mathematics....', since we believe that conceptual development, practice and application should be integrated not separated in teaching). However there is a failure to link the stated purposes and aims with the detailed content which follows. Little rationale is apparent for many detailed parts of the draft mathematics curriculum, other than that they are derived from curricula for high attaining countries. However many high attaining countries have a very different focus (e.g. Singapore focuses on problem-solving, Korea on creativity). We are not disputing that most objectives could be found in one or other curriculum from one of these countries, but the result is an incoherent list of which the purpose of individual items is unclear. In particular we do not believe that there are strong justifications in the 21<sup>st</sup> century for all students to practise written computation of large numbers until they are fluent - the time would be better spent on analysing problems to decide which methods to apply, and using calculators to carry out the computations as is the case in commerce and industry. (Although we would emphasise that fluent single-digit mental arithmetic needed to make estimates is essential.)
- 2) *Nature of the Content* The lists of content are claimed to constitute a programme of study ('that which is to be taught ...'), but also on p.2 the attainment targets are identified with the content lists. Much of these lists constitute a set of procedures, together with a few contrived word problems. These do not indicate a coherent programme of study, only the practice of one method followed by practice of another. The lack of problem-solving on non-routine problems (of the type included in PISA tests), whether real-world or mathematical problems, seems to suggest that applications and mathematical reasoning are not valued and do not encourage teachers to include them in their teaching. This directly contradicts the aims as listed on page 1. Nor do they constitute an adequate set of attainment targets, since understanding and application are missing. Specifying in detail the methods to be used is over-prescriptive - we should be concerned about what students

can do rather than what methods should be used. This also implies for example that national tests will assess only certain algorithms and that students who can solve problems effectively and efficiently by alternative and possibly more sophisticated methods will be penalised.

- 3) *Difficulty of the Content* There are aspects here which appear in earlier year groups than currently is the case. While this may be appropriate for some children, we are concerned that the effect of rushing many children through content more quickly than at present may be a more superficial understanding and a short-term coaching of algorithms which are not necessarily retained as connected to other knowledge.
- 4) *Does it address the problems?* There are a number of clear things which it is generally agreed could be done to improve the teaching of mathematics - for example more sustained, more connected and deeper blocks of teaching, and more integration of applications of the type which are assessed in the PISA tests which Ministers are concerned about. Both of these will be discouraged by the current proposals which seem to instead encourage fragmented curricula and lack of applications.