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Section D: English, mathematics, science and physical education

9 a) English

*What knowledge do you regard as essential to include in the Programme of Study for **English**? Please also set out **why** this is essential and at what age or key stage.*

The teaching of mathematics especially at KS1-2 depends on the logic and grammar inherent in speaking, reading and writing English.

Lack of such competence is a serious handicap to improving mathematical attainment. We hope this will be addressed in the National Curriculum.

10 a) Mathematics

*What knowledge do you regard as essential to include in the Programme of Study for **mathematics**? Please also set out **why** this is essential and at what age or key stage.*

Learning mathematics is a cumulative process in which the understanding of connections between topics learnt plays an essential role. So a detailed and coherent curriculum is needed to give clear guidance. It should outline core content. It should clarify necessary sequencing and connections which are needed as a basic foundation for those who will continue with the study of numerate disciplines beyond age 16, and provide a suitable core curriculum for other students. We elaborate on our views of what this should be like both in terms of content and level of detail in a separate submission.

*10 b) Considering your response to the above, should the Programme of Study for **mathematics** be set out on a year by year basis **or** as it currently is, for each key stage?*

In our thinking we have started with the 1999 curriculum. That accepts a structure in terms of key stages and rejects the idea of content being specified on a year-by-year basis. We think that is right: it allows for variability between schools and between classes in the same school.

Section F: Supporting and Recognising Progress

23 a) Do you think the National Curriculum should continue to specify the requirements for each of the 8 levels of achievement?

We do not regard the notion of levels of achievement as having any clear meaning in mathematics.

Learning mathematics is a long-term process and we do not think it helpful for teachers to focus on levels. Rather they need some appreciation of key mathematical goals, and ways to understand how their pupils are doing relative to them.

24 Within each Programme of Study, how should the curriculum and attainment targets be defined to ensure appropriate education for pupils in a wide range of circumstances as learners?

Teachers should be encouraged to understand that pupils who may later wish to take mathematics further need a richer diet than can be described in a National Curriculum, while those who struggle need to take

Rather they should follow a strengthened version of the programme which supports further study.

26 Please use this space for any other comments you would like to make about the issues covered in this section.

To avoid underachievement in mathematics it is important that teachers are clear about what foundations are needed to progress. A carefully crafted curriculum can help with this if the structure allows appropriate flexibility. In addition we see the need for a coherent programme of subject specific CPD over many years.

Section G: International Comparisons

27 a) Please give examples of any jurisdictions that could usefully be examined to inform the new National Curriculum. Please also briefly describe the reasons for the examples given.

PISA is of limited value as a diagnostic guide:

The problems are too distant from school mathematics and there are concerns about the marking and analysis.

Our thinking has been informed by insights from TIMMS 2003 and 2007.

Section J: Implementation