

# The Council for the Mathematical Sciences

Secretariat: Ivor J Goddard, De Morgan House, 57-58 Russell Square, London WC1B 4HS  
Tel: 020 7291 9979 Email: [cms@lms.ac.uk](mailto:cms@lms.ac.uk) web: [www.cms.ac.uk](http://www.cms.ac.uk)

Right Hon Ed Balls MP  
Secretary of State for Children, Schools and Families  
Sanctuary Buildings  
Great Smith Street  
London  
SW1P 3BT

16 April 2010

Dear Secretary of State,

## **Advanced Extension Award (AEA) in Mathematics**

I write as Chair of the Council for the Mathematical Sciences to support ACME's position on the ongoing need for an Advanced Extension Award (AEA)-type qualification in mathematics.

The Council for the Mathematical Sciences comprises the Institute of Mathematics and its Applications, the London Mathematical Society, the Royal Statistical Society, the Edinburgh Mathematical Society and the Operational Research Society, and has a particular interest in student progression to and success in mathematical sciences in Higher Education in the UK. The CMS feels that the introduction of the A\* grade at A-level (and the corresponding 'stretch and challenge' material to be introduced in some A-level units) will not be effective either in discriminating between the highest achieving candidates or inspiring and challenging the very best students; the retention of an AEA in mathematics is a necessary measure that the CMS supports.

Unlike many other A-level subjects, achieving a score of over 90% in an A-level mathematics examination is not necessarily an indication of being better prepared for a highly demanding degree course in the subject than having achieved a standard grade A. Moreover, the new grade promotes an approach to learning mathematics which does not reflect what is valued at degree level. Ultimately, it is the ability to 'think mathematically' – rather than merely master the content of a syllabus and complete standard questions to a very high level of accuracy – that is the best determinant of future success in mathematical sciences in Higher Education; the Advanced Extension Award is an effective way of measuring this skill amongst those that have access to the qualification, and the nature of the AEA examination encourages a healthier approach to mathematics which stimulates and inspires students working at the highest level.

One might presume that this issue can be tackled simply by introducing AEA-type questions to A-level examinations. The intention of improving the 'stretch and challenge' content at A-level is welcome, but the breadth of the ability of the A-level mathematics cohort renders it wholly impractical to include a sufficient number of questions that truly test the very best students to the extent that the AEA does. As ACME states, this is not a failing of the A-level as a qualification but is a natural consequence of the variety of destinations and purposes for which the subject is studied. An attempt to provide for the whole cohort through A-level mathematics alone would either be ineffective at the top end or would render parts of the examinations inaccessible to the majority of students and damage participation rates; neither of these is in the national interest.

The CMS agrees with ACME's statement that an extension award, together with Further Mathematics, is a necessary and effective response to the breadth of the cohort. The CMS therefore strongly supports ACME's position that the AEA in mathematics should be retained until such time as an improved replacement has been developed. Moreover, we hope that DCSF will commit the necessary resources – working with key stakeholders across the community – to develop such a replacement for the AEA.

Yours sincerely,

A handwritten signature in black ink, reading "David Wallace". The signature is written in a cursive style with a large initial 'D'.

Professor Sir David Wallace CBE FRS FREng  
**Chair, Council for the Mathematical Sciences**