



Department
for Education

Consultation Response Form

Consultation closing date: 19 September 2014

Your comments must reach us by that date

Reformed GCSE and A level subject content

If you would prefer to respond online to this consultation please use the following link: <https://www.education.gov.uk/consultations>

The government is reforming GCSEs and A levels to ensure that they prepare students better for further and higher education, and employment. GCSEs are being reformed so that they set expectations which match those of the highest performing countries, with rigorous assessment that provides a reliable measure of students' achievement. The new A levels will be linear qualifications that make sure that students develop the skills and knowledge needed for progression to undergraduate study.

Information provided in response to this consultation, including personal information, may be subject to publication or disclosure in accordance with the access to information regimes, primarily the Freedom of Information Act 2000 and the Data Protection Act 1998.

If you want all, or any part, of your response to be treated as confidential, please explain why you consider it to be confidential.

If a request for disclosure of the information you have provided is received, your explanation about why you consider it to be confidential will be taken into account, but no assurance can be given that confidentiality can be maintained. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded as binding on the Department.

The Department will process your personal data (name and address and any other identifying material) in accordance with the Data Protection Act 1998, and in the majority of circumstances, this will mean that your personal data will not be disclosed to third parties.

Please tick if you want us to keep your response confidential.	<input type="checkbox"/>
Reason for confidentiality:	

Name:	
Please tick if you are responding on behalf of your organisation.	X
Name of Organisation (if applicable): Royal Statistical Society	
Address: 12 Errol Street London EC1Y 8LX	

If your enquiry is related to the DfE e-consultation website or the consultation process in general, you can contact the Ministerial and Public Communications Division by e-mail: consultation.unit@education.gsi.gov.uk or by telephone: 0370 000 2288 or via the GOV.UK '[Contact Us](#)' page.

What best describes you as a respondent?

<input type="checkbox"/> Academies	<input type="checkbox"/> Awarding organisations	<input type="checkbox"/> Colleges
<input type="checkbox"/> Employers/business sector	<input type="checkbox"/> Further education	<input type="checkbox"/> Headteachers
<input type="checkbox"/> Higher education	<input type="checkbox"/> Local authorities	<input type="checkbox"/> Organisations representing school teachers and lecturers
<input type="checkbox"/> Parents	<input type="checkbox"/> Schools	<input type="checkbox"/> Subject associations
<input type="checkbox"/> Teachers	<input type="checkbox"/> Young people	<input checked="" type="checkbox"/> Other

<p>Please Specify:</p> <p>Learned society and professional body.</p> <p>The Royal Statistical Society (RSS) is one of the world's most distinguished and renowned statistical societies. It is a learned society for statistics, a professional body for statisticians and a charity which promotes statistics, data and evidence for the public good.</p> <p>We respond only to questions 4c, 4d, 5c and 5d on Mathematics at this time, however we do also have an interest in the statistical content of other subjects in</p>

schools, including Geography and Computer Science. For these we would recommend our report *A World Full of Data* (2013) which reviews the treatment of statistics across AS and A-Level subjects other than Mathematics (<http://www.rss.org.uk/uploadedfiles/userfiles/files/A-world-full-of-data.pdf>).

- 4 Is the revised A level content in each of these subjects appropriate in view of the issues raised in ALCAB's reports? Please consider:
- whether the content reflects what students need to know in order to progress to undergraduate study

Please provide evidence to support your response

4 c) Mathematics

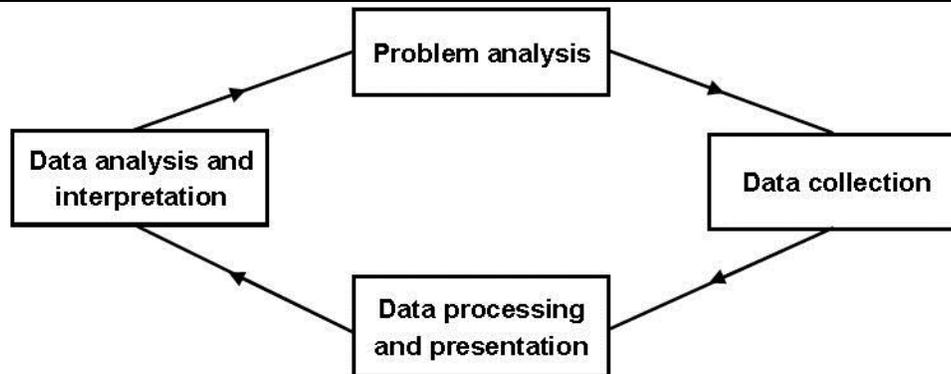
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Not Sure
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Comments:

To outline some of the principles from which we respond to this consultation, statistics is not simply a branch of mathematics. It is a distinct activity, which is fundamentally about information, numerical data, and about applying quantitative skills to real problems. Basic data handling and quantitative skills should be an integral part of the taught curriculum across most A level subjects. We should also put resources into making sure the new mathematics A levels, and Core Maths for those who don't wish to take A level mathematics, deliver appropriate statistical skills. In particular, we should ensure that all students learn to handle and interpret real data using technology.

The statistics cycle (below) promotes a way of understanding the world that is transferable across a range of subjects and situations, and is important to address this in full across the range of study routes that young people pursue.

The statistics cycle:



The consultation has a strong emphasis on progression into Higher Education. In response to this we would like to highlight that the same statistics content is not suitable for all the undergraduate courses for which statistics is needed. The prescription of 100% of content of AS and A-Level courses is therefore of modest concern to us, as there is no longer the flexibility to promote certain modules as preparation for particular undergraduate courses. In addition to the needs of statistics departments, we see different needs for quantitative skills in other subjects, across the scientific, technology engineering and mathematical (STEM) disciplines (including Computer Science), and in ‘Q-Step’ centres for the social sciences. Statistical learning in schools should offer welcome preparation for each of these disciplines. It is necessary to address statistical literacy across the range of routes that students take into higher education: for example whether they are pursuing mathematics AS or A-Level, ‘core maths’, A-Level sciences, business studies, geography, economics, or history. Each pathway must address quantitative skills appropriately.

On subject content, following ALCAB’s recommendations, we especially support the new requirement to interpret at least one real, large set of data. For statistics, non-exam assessment is a key component of valid assessment, and so it is important to specify these skills to such an extent that all schools engage with data in the classroom and over a lengthy period of time. We welcome the emphasis in the new Mathematics specification on problem-solving, interpretation and testing, and there is much to welcome too in the removal of tedious calculations and drawing of diagrams. The specification also clarifies technology use to a greater extent than has been the case previously.

In A03 (P33 and P34) however, with respect to the statistics cycle, we would like to point out that students should be able to “interpret the outcomes of a modelling process in real world terms and recognise the limitations of a model” suggests that any examination should include model fitting to real data with analysis and interpretation. However this does not allow for any aspect of data collection, feedback between model fitting and data editing, which are part of the data analysis cycle. The same shortcoming is shared in the AS Level specification.

We also agree with the concern expressed by MEI (Mathematics in Education and

Industry) that specifications of the use of data and the use of technology could go further and be made clearer. For example and in particular, specifications should set out *how* large data sets should be provided. We think that this would assist practitioners in their teaching of practical interpretative skills, and that this assistance is needed given the new absence of coursework. In the absence of this guidance, it may be that awarding organisations and schools are not prompted to support the formative teaching of data analysis in their own approach to the final exam, and take more of a ‘tick-box’ approach over time. We also support MEI’s call for the piloting of exam question formats. It is necessary to see what works best both to prompt formative data assignments and to assess the results of these robustly.

4 d) Further mathematics

Yes

No

Not Sure

We share some of the concerns raised by others in the mathematics community – for example by ACME and by MEI – that participation in both Mathematics and Further Mathematics may fall due to the shift from a modular to a linear structure with an exam at the end of the course. We would regret losing Further Mathematics participation under this model, as for advanced statistics it is important to prepare, in a breadth of ways, the most advanced end of the mathematics cohort, in addition to supporting more fundamental quantitative skills across other subjects. We welcome however the ongoing flexibility to choose different Further Mathematics specialisms, especially as this flexibility is no longer proposed for Mathematics.

5 Is the revised AS qualification content in each of these subjects appropriate?

Please provide evidence to support your response.

5 c) Mathematics

Yes

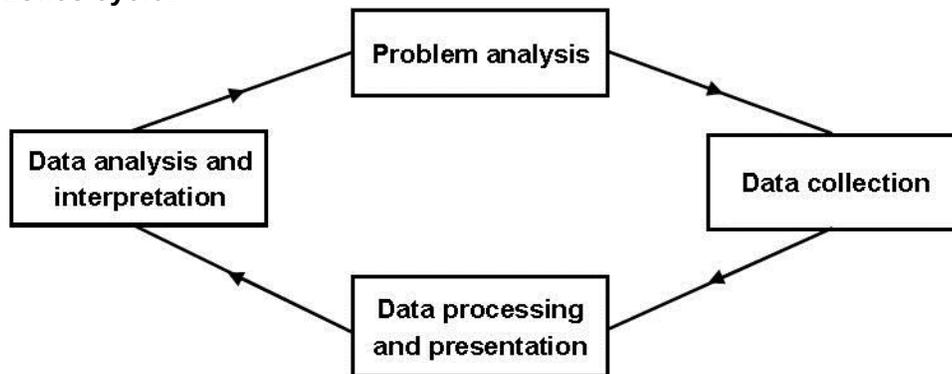
No

Not Sure

Comments:

We welcome the inclusion of hypothesis testing in AS Mathematics. We are concerned however that the statistical problem-solving cycle (see below) is not specified in its entirety. In A03 (P33 and P34, with respect to the statistics cycle, students should be able to “interpret the outcomes of a modelling process in real world terms and recognise the limitations of a model”. This suggests that any examination should include model fitting to real data with analysis and interpretation. However this does not allow for any aspect of data collection, feedback between model fitting and data editing, which are part of the data analysis cycle. Statistical literacy is so important – for higher education, employment and for good citizenship – that we would like to see it having a bigger role in all post-GCSE pathways.

The statistics cycle:



In addition to this we think that there is a general need to pilot and support the new co-teaching of AS-Level alongside A-Level in schools, given that the AS Level will no longer contribute toward A Level grades, and that this is a significant change.

5 d) Further mathematics

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Not Sure
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Comments:

We think that there is a general need to pilot and support the new co-teaching of AS-Level alongside A-Level in schools, given that the AS Level will no longer contribute toward A Level grades, and that this is a significant change.

5 e) Geography [no response]

Thank you for taking the time to let us have your views. We do not intend to acknowledge individual responses unless you place an 'X' in the box below.

Please acknowledge this reply.	X
E-mail address for acknowledgement: o.varley-winter@rss.org.uk	

Here at the Department for Education we carry out our research on many different topics and consultations. As your views are valuable to us, please confirm below if you would be willing to be contacted again from time to time either for research or to send through consultation documents?

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
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All DfE public consultations are required to meet the Cabinet Office [Principles on Consultation](#)

The key Consultation Principles are:

- departments will follow a range of timescales rather than defaulting to a 12-week period, particularly where extensive engagement has occurred before
- departments will need to give more thought to how they engage with and use real discussion with affected parties and experts as well as the expertise of civil service learning to make well informed decisions
- departments should explain what responses they have received and how these have been used in formulating policy
- consultation should be 'digital by default', but other forms should be used where these are needed to reach the groups affected by a policy
- the principles of the Compact between government and the voluntary and community sector will continue to be respected.

If you have any comments on how DfE consultations are conducted, please contact Aileen Shaw, DfE Consultation Coordinator, tel: 0370 000 2288 / email: aileen.shaw@education.gsi.gov.uk

Thank you for taking time to respond to this consultation.

Completed responses should be sent to the address shown below by 19 September 2014.

Send by e-mail to: Gcseandalevel.consultation@education.gsi.gov.uk

Send by post to: Alex Smith, Floor 2, Sanctuary Buildings, Great Smith Street, Westminster, London SW1P 3BT, UK