



Department
for Education

Consultation Response Form

Consultation closing date: 5 November 2015
Your comments must reach us by that date

Additional Reformed GCSE and A level subject content consultation

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

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: Olivia Varley-Winter	
Please tick if you are responding on behalf of your organisation.	<input checked="" type="checkbox"/>
Name of Organisation (if applicable): The 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 Department's ['Contact Us'](#) page.

Please insert an 'x' into one of the following boxes which best describes you as a respondent.

<input type="checkbox"/> school	<input type="checkbox"/> academy	<input type="checkbox"/> college or further education institution
<input type="checkbox"/> teacher	<input type="checkbox"/> organisations representing school teachers or lecturers	<input checked="" type="checkbox"/> subject associations
<input type="checkbox"/> parent	<input type="checkbox"/> young person	<input type="checkbox"/> higher education establishment
<input type="checkbox"/> employer/business sector	<input type="checkbox"/> local authorities	<input type="checkbox"/> awarding associations
<input type="checkbox"/> other		

Comments:

The Royal Statistical Society (RSS) is a learned society and professional body for statisticians and data analysts. We are one of the world's leading organisations to promote the importance of statistics and data, and have done so since we were founded in 1834. One of our six key strategic goals for 2014-2018 is for society to be more statistically literate, so that people's understanding of data, risk and probability can inform their daily decision making, leading to better outcomes. Our Education Policy Advisory Group has advised RSS' response to the consultation with this goal in mind. While in general we retain an interest in statistics across the curriculum (including how it is embedded within a wide range of subjects), our response here focuses on GCSE, AS and A Level Statistics.

1. Is the revised GCSE content in each of these subjects appropriate? Please consider:

- whether there is a suitable level of challenge
- whether the content reflects what students need to know in order to progress to further academic and vocational education
- whether the amount of content in the qualification is appropriate and, if not, whether you have any suggestions for removing or adding content

Please provide evidence to support your response:

1 f) Statistics

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

Comments:

Some aspects of the specification require revision, for example to provide better guidance. However we broadly welcome the areas included in the draft content. In particular, the content makes clear that GCSE Statistics is intended to be a practical subject where students engage in doing investigations, “using statistical techniques in a variety of authentic investigations, using real world data (both primary and secondary as appropriate) in contexts such as, but not limited to, populations, climate, sales etc.” In keeping with this, in response to Ofqual’s consultation on assessment, we are disagreeing with the proposal for all subject content to be assessed by written examination. While we recognise that good practice needs to be assured, we believe that applied aspects of statistical enquiry can best be addressed in practical assessment. As such, we would prefer non-exam assessment weighted with at least 20-25% of the marks. Our response points to reformed STEM subjects such as Computer Science and Engineering, which both retain coursework to address practical aspects of the subject.

On points of detail in the content, some statements need correcting or refining. For example the specification requires knowing notation for conditional and independent probability, however the concepts themselves are neither included nor related to any of the rest of the content. The given formula for a regression line on page 11 to 12 (which students are expected to recall) only provides the formula for a straight line, and is not specific to regression. Statisticians should be consulted on these more detailed points.

We are glad that the specification emphasises the use of technology, which we regard as essential. Developments in technology, in particular the availability of software for data processing and analysis, have led to profound changes in the accessibility of data and in approaches to statistics and data analysis. It is crucial that this should be reflected in statistics as a reformed subject. The draft content specifies “direct experience of using some of the technologies that have enabled the collection,

visualisation and analysis of large quantities of data to inform decision-making processes in public, commercial and academic sectors.” Access to standard software for data analysis (Excel or similar) will be crucial. This access will be needed not only for statistics but also for other subjects at GCSE and at A Level making use of data, as has been highlighted in our previous work on the use of data across the curriculum.^{1, 2} Schools need to maintain access to appropriate IT for this, and the Department needs to support their capacity to do so.

¹ Porkess, R. & Dudzic, S. (2013) *A world full of data: Statistics opportunities across A-level subjects* [PDF]. Royal Statistical Society & Institute & Faculty of Actuaries. Available from: <http://www.rss.org.uk/Images/PDF/influencing-change/A-world-full-of-data.pdf> (accessed November 2015)

² Porkess, R. (2012) *The Future of Statistics in our Schools and Colleges* [PDF]. Royal Statistical Society & The Actuarial Profession. Available from: <http://www.rss.org.uk/Images/PDF/publications/rss-reports-future-statistics-schools-colleges-roger-porkess-2012.pdf> (accessed November 2015)

2. Is the revised AS and A level content in each of these subjects appropriate? 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.

2i) Statistics

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

Comments:

The draft content describes the primary aim as “the development of the statistical elements employed across the A level curriculum.” While we do not disagree with this, content needs to focus more thoroughly on the aim of “transition to higher education or employment in any quantitative discipline.” The aim to prepare students for further study therefore needs greater emphasis.

To put A Level Statistics into context, we are glad to promote a role for the revised qualification as part of the landscape of post-16 statistics qualifications. It is important to recognise that, similar to other subjects being reformed at this stage, A Level Statistics has been a subject with relatively small annual cohorts of students. We welcome substantial redevelopment of content, as we have received comments in favour of the subject’s redevelopment, and against the pre-reform balance of content. We have reviewed the content as it stands and recommend some further revision.

In terms of its place within the wider landscape of post-16 qualifications, it is important to recognise the difference between statistics within new A level Mathematics compared to proposed A level Statistics. This difference lies in the scope for A level Statistics to address the full statistical enquiry cycle, to apply methods and solve statistical problems in a variety of contexts. It is much more applied in its emphasis and allows students to extend their statistical knowledge and understanding beyond that in A level Mathematics (and indeed, new Level 3 Core Maths qualifications), including in areas such as probability theory, and the use and interpretation of statistical tests.

This aim should not be confused with wider efforts to develop core quantitative skills for all students, as it should be recognised that many students within the English system will continue not to choose AS/A Level Mathematics or AS/A Level Statistics. These learners require access to alternative mathematics qualifications at Level 3, represented in the development and piloting of Core Maths qualifications, to develop their quantitative skills. Expanded uptake at Level 3, as well as the embedding of appropriate statistical content and methods in other subjects across the curriculum, will reinforce and develop the numeracy, quantitative and data skills, and statistical literacy that are

increasingly needed across academic disciplines and in industry.

Our review has identified some areas for revision. Primarily, this further work should ensure that A Level Statistics is closely focused on the demands of undergraduate level study in quantitative disciplines. Aspects of this are reflected in the content but need to be strengthened and highlighted in the proposed aims.

There are also some aims that are addressing points of detail rather than over-arching requirements, and would be better relegated to the content. For example, “generating and interpreting diagrams” seems better included as content rather than an aim, as does “applying formulae”. Conversely, within the content, we find certain items that are more ambitious and should be reflected in the aims for higher level study, such as modelling. There is therefore some disconnect between the aims and the content.

Finally, on certain unique topics within A Level Statistics, we would also highlight that accompanying guidance will be needed. In particular we notice the inclusion of bootstrapping and effect size. These are new topics for teachers as they will not have encountered them when teaching other subjects. Awarding organisations should seek to provide guidance in the unique elements of A Level Statistics, for these to be taught successfully. Guidance on unique elements should also in our view be added to the subject specification and content as this is shared across exam boards. Statistical experts should be consulted for this.

3. Do you think that any of the proposals have the potential to have a disproportionate impact, positive or negative, on specific students, in particular those with 'relevant protected characteristics'? (The relevant protected characteristics are disability, gender reassignment, pregnancy and maternity, race, religion or belief, sex and sexual orientation.)

Please provide evidence to support your response.

Yes

No

Not Sure

Comments:

4. How could any adverse impact be reduced and how could the subject content of GCSEs and/or A levels be altered to better advance equality of opportunity between persons who share a protected characteristic and those who do not share it?

Please provide evidence to support your response.

Comments:

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?

Yes

No

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 email: consultation.unit@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 5 November 2015

Send by post to: Send by post to: Bethany Caines, Floor 2, Sanctuary Buildings, Great Smith St, Westminster, London SW1P 3BT

Send by email to: 2017qualsreform.CONULTATION@education.gsi.gov.uk