DfE consultation on Additional reformed GCSE and A level subject content
(closing date 5 November 2015):
Response from the London Mathematical Society
Our comments relate to Statistics (at GCSE and at A/AS level)
The consultation process. Before presenting our response in 1 and 2 below we would like to
express our concern at the procedures adopted in the reform of these qualifications. As with other
recent reforms, the procedures make plain the lack (which we and others have often pointed out) of
a body which oversees curriculum reform and development, ensuring proper, effective and
transparent use of expertise as well as coherence and intellectual rigour.
Particular concerns include:
 The consultations on content and assessment are being made simultaneously. Normal
procedure is first to agree content, and then to design an appropriate assessment.
 It is not clear who has drawn up the documents setting out the proposed content for these
qualifications. One can merely infer something about this in the information about from
Annex 1 of the consultation document where it lists those who were consulted (rather than
those who were the primary writers).
 According to the consultation document ‘Awarding organisations were unable to consult
with all subject groups and we welcome the input of organisations, teachers and students in
this public consultation’. This suggests that awarding organisations have drawn up the

Statistics is also a major constituent of all “Core mathematics” syllabuses, which are being developed
as the preferred numerate qualification for those who choose not

entries for GCSE Statistics in Year 10 or below almost doubled to 29212, while entries in Year 11 fell
from a high of 34730 in 2014 to 26597 in 2015. So it looks as though students are increasingly being
entered for GCSE Statistics before taking GCSE Mathematics – rather than the other way round.)
Note: This makes the GCSE Statistics entry larger than that for German or Music, and roughly half
the size of Physics, or Chemistry or Biology or ICT.
We therefore see considerable potential value in having a GCSE Statistics available for a range of
abilities, provided central pressure continues to ensure that it is not the main numerate subject
studied in Year 11.
2.2 However, there are two features of the design implicit in the draft, which need to be changed.
2.3 The simplest change that is needed concerns coursework. Whether candidates are taking GCSE
Statistics because they find mathematics easy, or to provide practical support for their numerate
development, there is no escaping from the extent to which learning statistics, and assessing that
learning, demands a strong practical element.
2.3.1 The requirement seems so clear, that the lack of such an emphasis in both the draft content
and in the assessment can only be explained in terms of an understandable, but over-zealous,
bureaucratic commitment to assessing solely through exams wherever possible.
2.3.2 In the case of GCSE Statistics, both the discipline itself and the educational value which it can
offer to students, would seem to demand a specification which presumes, and an assessment regime
which incorporates, a suitable coursework component.
2.3.3

Further thought is also needed concerning:
(i) the exclusion of some material which would seem to be important (such as the idea of a
“null hypothesis”), and
(ii) the confusion of key ideas which deserve to be more clearly stated (such as the fact that
the highlighted summary in “A” (para 8 on page 4) should begin by emphasising the kind of
questions, or hypotheses that can be subjected to statistical scrutiny, and that a statistical
enquiry needs to identify such a question, or hypothesis, before moving on to consider what
data to collect, or how to collect it)
(iii) the inclusion of some material, which appears arbitrary, or which is not liable to
quantitative analysis at GCSE level, or which cannot really be understood at this level
(thereby officially encouraging a “cook-book” approach – which is especially worrying when
fundamental ideas are presented in the content draft as things candidates merely need to
“know” – with no recognition or indication of their subtlety: see e.g. section E).
The flaw indicated in (iii) pervades the whole specification, where one finds an emphasis on words at
the expense of key ideas: (e.g. Is the idea of a distribution addressed appropriately anywhere? If so,
we missed it.) We realise that part of the challenge of GCSE Statistics is to raise questions that are
far more subtle than mere “applied number”; but the draft fails to clarify how the emphasis on
language and ideas in pages 3-6 relates to the techniques implicit in pages 6-8.
More worrying still is the blatant attempt to re-frame the whole of statistics teaching in England in
terms of “the statistical enquiry cycle” via Appendix 4 of a draft content list, which has never been
openly debated, or refined. This is simply wrong.
The idea of a “statistical enquiry cycle” can be helpful; but the version concocted in Appendix 4 of
the content draft does not appear to have been trialled or refined in any way. The idea has some
strengths: e.g. it recognises the need to start with a question or hypothesis. But the proposed form
also has major shortcomings: e.g. the “cycle” is never summarised in memorable form – as, for
example, in Porkess’s four-stage cycle, or in New Zealand’s five stage PPDAC [Problem, Plan, Data,
Analysis, Conclusion], and the proposed version has a disproportionate emphasis on qualitative
presentation at the expense of analysis.)
It may be that content and assessment can usefully be framed in such terms – but in the absence of
open discussion, professional consensus, trialling, and consequent refinement, nothing is gained
(and much may be lost) by replacing familiar criteria by an unfamiliar, opaque, mantra “the
statistical enquiry cycle” – especially one which is so elaborated so poorly (in Appendix 4).