National Curriculum Review - Call for Evidence

Consultation Response Form

The closing date for this consultation is: 14 April 2011
Your comments must reach us by that date.

Department for Education

THIS FORM IS NOT INTERACTIVE. If you wish to respond electronically please use the online or offline response facility available on the Department for Education e-consultation website (http://www.education.gov.uk/consultations).

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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.

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Please tick if you want us to keep your response confidential. ☐

Reason for confidentiality:

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If your enquiry is related to the policy content of the consultation you can contact the DfE Public Communications Unit on:

Telephone: 0370 000 2288

e-mail: NCReview.RESPONSES@education.gsi.gov.uk

If you have a query relating to the consultation process you can contact the Consultation Unit on:

Telephone: 0370 000 2288

e-mail: consultation.unit@education.gsi.gov.uk

SECTION A: ABOUT YOU

Please select ONE box that best describes you as a respondent. (Head teachers and teachers please select the school sector you work in).

☐ Parent/Carer	☐ Chair of Governors/Governor	☐ Pupil/Student
☐ Secondary School	☐ Primary School	☐ Special School /SEN Sector
☐ Academy	☐ Independent School	☐ Early Years Sector
☐ Local Authority	☐ Employer/Business Sector	☐ Subject Association
☐ Awarding Organisation	☐ Government Body	☐ Higher Education - Education Specialist
☐ Higher Education - Other	☐ Further Education Provider	☐ Learned Society
☐ Teaching Association/Union	X Other (please specify in box below)	

Please Specify:
Independent mathematics curriculum development organisation.

Is your response representative of an organisation or is it an individual response?

X Organisation	☐ Individual

Please Specify:
Mathematics in Education and Industry

SECTION B: FOR PARENTS AND CARERS ONLY (Q1 - Q5) (Please go to Section C if you are not a parent or carer)

SECTION C: GENERAL VIEWS ON THE NATIONAL CURRICULUM (**Q6a - Q8**)

The National Curriculum is one part of the wider school curriculum. Each subject in the National Curriculum has a statutory Programme of Study that is determined by the Government setting out the content to be taught in that subject. Schools are legally required to teach these subjects and the specified content to all pupils at the relevant key stages (a key stage is a group of school years). More information on the current National Curriculum can be found here.

The National Curriculum was originally envisaged as a guide to what children should learn in key subjects, giving parents and teachers confidence that students were acquiring the knowledge necessary at each level of study to make appropriate progress. As it has developed, the National Curriculum has come to include more subjects, prescribe more outcomes and take up more school time than originally intended. It is the Government's intention that the National Curriculum be slimmed down so that it properly reflects the body of essential knowledge in key subjects and does not absorb the overwhelming majority of teaching time in schools. Individual schools will then have greater freedom to construct their own curricula in subjects outside the National Curriculum, to reflect local circumstances and the needs of their pupils.

The purpose of this section is to find out your general views on the current National Curriculum and what, if anything, you think should be changed.

6 a) What do you think are the key strengths of the current National Curriculum?

Comments:
For mathematics, the National Curriculum enables us to have a nationally agreed standard of what we want students to know, understand and be able to do.

The current National Curriculum puts emphasis on being able to use mathematics and on understanding connections within mathematics; this is set out in the key processes. This emphasis, through the new GCSE assessment objectives, has led to some GCSE questions which test students' understanding and problem solving. Anecdotal evidence suggests that students find these questions more difficult that the more predictable types of questions. However, it is important that students develop strong understanding and problem solving skills in order to be able to use mathematics. Consequently, this aspect of the current National Curriculum should be preserved. However, there may be better ways of doing this than keeping the current "key process" statements.

6 b) What do you think are the key things that should be done to improve the current National Curriculum?

Comments:
There is insufficient detail in the current National Curriculum for teachers to have a clear understanding of what they need to teach. This lack of detail also makes national assessment difficult. In order for assessment to be fair, assessors, teachers and students all need to know exactly what is to be assessed.

At KS4, students are assessed by means of GCSE examinations. In order to facilitate student progression to further study, and for employers to understand what young people with GCSE Mathematics can be expected to know, it is helpful if all GCSE examinations in mathematics have a common core of content. This is currently defined in the GCSE Mathematics criteria. Teachers at KS4 refer to GCSE specifications from the awarding bodies, which are based on these criteria, rather than to the KS4 programme of study per se. In order to ensure that the taught national curriculum at KS4 is determined by the intended National Curriculum, there needs to be sufficient detail in National Curriculum documentation to define GCSE core content. Some of the problems inherent in the process leading to the current GCSE criteria are outlined in the letter from the Royal Statistical Society to Ofqual: http://www.rss.org.uk/uploadedfiles/documentlibrary/776.pdf

The content and emphasis of the taught curriculum at KS4 should not be trusted to the awarding bodies. It should be agreed nationally, after consultation. It is important to understand that mathematics is a cumulative subject where understanding builds over many years. The key task is to decide what we want students to know, understand and be able to do in mathematics at age 16, and then to construct the National Curriculum in mathematics accordingly.

7 a) What are the key ways in which the National Curriculum can be slimmed down?

Comments:
The Mathematics National Curriculum has been slimmed down. However, examination specifications need to specify what will be examined so one effect of “slimming down” the curriculum has been to allow awarding bodies to determine the taught National Curriculum in mathematics at KS4 (which has a roll back effect to KS3). For Mathematics, the key task is not to “slim down” the curriculum but to decide what we want students to know, understand and be able to do at age 16. The Programmes of Study need to contain sufficient detail to enable new and non-specialist teachers of mathematics to understand what should be taught. The current National Curriculum Programmes of Study are insufficiently detailed for that purpose.

7 b) Do you think that the proportion or amount of lesson time should be specified *in any way* in the National Curriculum; eg for particular subjects and/or within particular key stages?

X Yes	☐ No	Not Sure

Comments:
Mathematics is a vital element of compulsory education and it is helpful to have national recommendations about the time needed to teach mathematics, so that students’ entitlement is clearly understood.

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

Comments:

SECTION D: English, mathematics, science and physical education (Q9a-Q13)

The remit for the review makes clear that English, mathematics, science and physical education (PE) will remain National Curriculum subjects at all four key stages (i.e. from age 5 to 16). The introduction of the new National Curriculum will be phased, with new Programmes of Study for these four subjects being taught from September 2013. In terms of the detailed content of the Programmes of Study, this initial call for evidence therefore focuses on the four subjects in the first phase of the review. A further call for evidence will be launched in early 2012 in relation to all other subjects that it is decided should be part of the future National Curriculum, and new Programmes of Study for those subjects will be taught from September 2014. This decision will be made in light of responses to this call for evidence (see Section E).

The intention is that in future the National Curriculum should focus on the essential knowledge in key subjects that all children need to acquire in order to progress in their education and take their place as educated members of society.

Against that background, the questions below ask for your views on what is essential to include in the Programmes of Study for the four subjects in phase one. In particular:

- For English, mathematics and science, we would like your views on the essential knowledge that pupils need in order to deepen their understanding at each stage of their education. Your views will help inform the content of new statutory Programmes of Study for each subject.

- For physical education, we would like your views on what should be included in a shorter, less prescriptive Programme of Study.

We are seeking your views on what you regard as the essential knowledge (eg facts, concepts, principles and fundamental operations) that pupils should

be taught in each subject considered in this section, and why. Please note that the current National Curriculum uses terms such as "knowledge, skills and understanding" but you are free to use whatever language you see fit in setting out your responses. What is more important is setting out the knowledge itself and why you regard it as essential.

We are particularly interested in any evidence that demonstrates the positive impact of your proposals. This might, for example, be formal research, examination/test results, or evidence of progress for particular groups of students.

If you would prefer to base your comments on either the current or a previous version of the National Curriculum Programmes of Study, please feel free to do so but we would ask you to make clear in your response which version of the Programme of Study you are referring to. If you have produced a draft of one or more Programmes of Study which you would like us to consider, you may wish to submit this to NCReview.DOCUMENTS@education.gsi.gov.uk and refer to it in your response.

Note that you do not need to respond to all the questions in this section: for example, you may want to focus on particular subjects and / or on particular ages or key stages.

9 a) **English**

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. If you prefer to submit evidence separately on this matter, please send this to: NCReview.DOCUMENTS@education.gsi.gov.uk

Comments:

As stated earlier, the key task in constructing a National Curriculum in Mathematics is to decide what we want students to know, understand and be able to do at age 16. Due to the cumulative nature of mathematics as a subject, many of these ideas are introduced and developed across the key stages.

In order to ensure students' progression in mathematics throughout their secondary education, KS3 should take account of what we need students to know, understand and be able to do by the end of KS4. This is vital in mathematics, where understanding is built on what students already know and where there is a very wide range of levels of understanding within any year group.

Aims for teaching mathematics to age 16

Numeracy and the basic mathematical understanding required for citizenship

Statistical understanding and the ability to read and interpret graphs are essential for students to be able to participate fully in society. The amount of data available to the public has increased greatly in recent years, especially through news media, advertising, financial services and the use of performance measures in the workplace and in public services. The internet allows vast quantities of data to be freely available to the public. The ability to work with data and understand its implications is increasingly important.

An understanding of probability is essential for students to be able to assess and understand risk and make decisions based on evidence.

All students need to understand and be able to work easily with numbers, including percentages and proportional reasoning, in order to be numerate; this includes the financial understanding necessary for everyday life. Students need to be able to make sensible estimates as well as to calculate exact answers.

Understanding ideas of perimeter, area and volume is an important aspect of basic mathematical understanding. All students should have some exposure to these ideas with the most able studying more complex shapes to enable them to solve more sophisticated problems.

The understanding required to use mathematics

It is essential that students see mathematics as something that is used to solve real problems and not just as a collection of techniques which they are taught in school in order to pass examinations. They need to be able to select the appropriate techniques to solve a problem and be prepared to try different approaches to solve problems.

An ability to use ICT for solving mathematical problems

An introduction to numerical methods is important for students to be able to understand the key contribution of ICT to solving mathematical problems which would otherwise be very difficult to solve.

The use of software such as graph drawing packages, dynamic geometry software and spreadsheets should be part of the experience of all students.

The mathematical understanding required for other subjects in the curriculum and for future employment

Statistics is widely used in other subjects and it is important for the development of students' understanding that they make connections between what they are taught in mathematics and what they experience in other subjects in school. Coordination of the development of statistical understanding across the curriculum is important; this should be the responsibility of mathematics departments.

Students need an understanding of proportion for science and for many other subjects, as well as for everyday situations in life generally. Science also requires some understanding of non-linear relationships.

Understanding standard index form is necessary for work in science and engineering.

Algebraic understanding, including the use of letters to stand for unknowns and variables, is important for science and engineering.

Being able to work with coordinates and graphs is essential for many other subjects and for working with real life applications. Being aware of different types of graphs and being able to recognise and interpret them, and the kinds of real situations in which they occur, is essential to students being able to use mathematics in solving problems and in appreciating its applicability in the real world.

An appreciation of the nature of mathematics as a subject and an introduction to possible future study of mathematics

Algebraic understanding is fundamental for a proper appreciation of mathematics. It is essential for students who proceed to any further study of mathematics. It is also vital for solving problems in science and engineering, and in other disciplines. In short, it is an essential part of the general language of mathematics. However, to enable students to understand and appreciate algebra, it is important to make connections between algebra, number and shape, and to apply algebra to solve real problems.

Understanding how geometry links mathematics with visual aspects of the real world, and the reasoning which students use in solving geometric problems involving angles, symmetry and similarity is a type of thinking which all students should be encouraged to develop.

The idea of mathematical proof is central to the distinctiveness of mathematics as a discipline. However, students often find it difficult to understand the idea of mathematical proof; contexts in geometry, such as the circle theorems, have the merit of the proofs not being too difficult, while it is also not obvious to students that the results being proved are always true.

Understanding Pythagoras' theorem and using trigonometry are essential for solving problems in the real world.

A general understanding of statistics, algebra, geometry and the concept of mathematical proof is part of being an educated person.

Arising from these aims, a possible core of content for the statistics within GCSE Mathematics is offered in Appendix 1 in order to illustrate the level of detail required in such a core. Although this is presented as a list in this document, it is important to present the programme of study in a way which emphasises the links within mathematics, to encourage deeper understanding. Such a core should be defined within the National Curriculum following appropriate consultation. The question of whether the core content should form all, or some, of the content of GCSE Mathematics depends on whether we have one GCSE or two.

MEI supports the twin GCSE structure currently being piloted, with separate GCSEs for Methods and Applications and a strong emphasis on problem solving.

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?

☐ Year by Year	X Key Stages	☐ Not Sure

Comments:
Students at the same age vary greatly in their understanding of mathematics; the nature of mathematics means that attempting to prescribe the National Curriculum on a year by year basis would result in some students being “taught” things which they already know while others are “taught” things where they do not have the foundations to enable understanding. Moreover, it is important for teachers to make links between different areas of mathematics and so the detailed organisation of the curriculum into a year by year programme should be left to teachers.

Some parents find the division into key stages helpful so that they have an indication of what students should be learning and can understand the performance of their children against a national standard. Most students in state education change schools at age 11 so an alternative possibility would be to have a primary mathematics curriculum and a secondary mathematics curriculum and leave decisions about ordering and progression to teachers. Schools should inform parents about what their children will learn and how this fits in with national expectations.

SECTION F: SUPPORTING AND RECOGNISING PROGRESS (Q23a-Q26)

Currently, the National Curriculum defines pupils' attainment through subject specific Attainment Targets which set out 8 level descriptors (Level 1 to Level 8) describing what pupils should be able to do to achieve each level. The expectation is that most pupils achieve:

- Level 2 at the end of Key Stage 1
- Level 4 at the end of Key Stage 2; and
- Level 5/6 at the end of Key Stage 3.

At the end of Key Stage 4 pupils are assessed through GCSE examinations.

Under the 2002 Education Act the specified purpose of statutory assessments for the key stages is to ascertain what pupils have achieved in relation to the attainment targets (eg the knowledge, skills and understanding which pupils of different abilities and maturities are expected to have) for that key stage.

Schools also have a responsibility to provide a broad and balanced curriculum for all pupils, and the National Curriculum statutory inclusion statement sets out three principles for developing an inclusive curriculum:

- Setting suitable learning challenges.
- Responding to pupils' diverse learning needs.
- Overcoming potential barriers to learning and assessment for individuals and groups of pupils.

In setting out the range of needs of pupils, the current National Curriculum includes the following groups of pupils:

gifted and talented
pupils with learning difficulties and disabilities
pupils from different ethnic groups including travellers, refugees and asylum seekers
pupils who are learning English as an additional language
boys and girls with different needs
children in care

This section is about your views on supporting progress of all pupils. In particular, whether there are credible alternatives to attainment targets that would better support and recognise all pupils' progress, irrespective of their attainment and background, and how to address the needs of all pupils though the National Curriculum.

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

☐ Yes	☐ No	X Not Sure

Comments:
There is often too much emphasis on assessing students' levels, rather than on improving their understanding. Students in some schools are assessed at one of 24 sublevels at least once every half term. It is hard to see how this improves their learning. Moreover, there can be an assumption that students should progress through these 24 sublevels at a uniform speed; where is the evidence for such a belief? We should consider whether the national curriculum levels have outlived their usefulness and whether we can find more helpful ways of understanding student progress.

23 b) If you have answered no or not sure, what alternative(s) do you propose to replace Attainment Target level descriptors? You may want to suggest different approaches for different subjects and/or different key stages.

Comments:
Different countries use different ways of assessing and reporting on student progress; teacher assessment is often a part of this process. We should explore and try out different approaches to assessing student progress.

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?

Comments:
As stated earlier, the Mathematics National Curriculum should allow teachers the freedom to make appropriate decisions for their students.

25 a) How do you think the needs of low-attaining pupils should be addressed through the National Curriculum?

Comments:
It is essential that lower attaining pupils (and their teachers) are not made to feel as though they are constantly failing because their attainment is less than average and their progress is less fast than average. The focus should be on developing what students are able to do rather than on highlighting what they cannot do; successes should be celebrated rather than being dismissed as insufficient. The good practice which exists in teaching students who find mathematics difficult should be shared; the ideas and methods which work for students who struggle with mathematics may well have spin-offs for students who find it easier.

25 b) How do you think the needs of high-attaining pupils should be addressed through the National Curriculum?

Comments:
Teachers need guidance on teaching such students in both primary and secondary schools. At present there is too much emphasis on speeding able students through the National Curriculum, rather than on going beyond the curriculum to deepen their understanding and increase their enjoyment of mathematics. Accelerating students in this way emphasises an algorithmic, memory-based approach to learning mathematics, which is counter-productive when students progress to mathematics beyond GCSE.

For high-attaining students in mathematics, the focus should be on ensuring a high level of understanding and enjoyment of mathematics by age 18 (with the expectation that all such students should continue some study of mathematics to that age).

Preparing students for GCSE Mathematics without considering progression after GCSE produces students who are not sufficiently fluent in mathematics to progress successfully. MEI's paper about the effects of two tier GCSE on the transition to AS Mathematics can be found here: http://www.mei.org.uk/index.php?page=discussions&discussionid=7

25 c) How do you think the needs of pupils with special educational needs and disability (SEND) should be addressed through the National Curriculum?

Comments:
These students need support from skilled teachers with specialist knowledge. This cannot be addressed directly by the National Curriculum, but the National Curriculum should be sufficiently flexible to enable it to be adapted by teachers to the specific needs of individual students.

There is much experience of making appropriate adaptations to the mathematics curriculum and resources for students with special educational needs or disabilities. Teachers should be able to tap into this expertise; ways must be found of ensuring that appropriate help and support are available for all children who need it.

25 d) How do you think the needs of other specific groups of pupils should be addressed through the National Curriculum?

Comments:
Their teachers are best placed to decide how to structure the national curriculum to meet their needs.

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

Comments:

SECTION G: INTERNATIONAL COMPARISONS (Q27a - Q28)

The remit for the review makes clear that we need to learn from the very best that has been achieved in other jurisdictions - countries or regions within countries - and ensure that the construction and content of the new National Curriculum is based upon international best practice.

This section seeks your views on what can be learned from other countries and states to inform the development of the National Curriculum. Your views may be based on particular expertise in international comparisons, or from your own experiences of living or working in particular countries.

We would be particularly keen to learn about international comparisons beyond the commonly assessed areas of literacy, mathematics and science in the PISA, TIMMS and PIRLS studies.

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.

Comments:
The Netherlands should be one of the countries considered. They have a developed a holistic understanding of student progress in mathematics and their curriculum aims to ensure that students develop mathematical understanding.

Realistic Mathematics Education (RME), developed by the Freudenthal Institute in Utrecht, gives a method of teaching mathematics that is based upon starting from contexts and which appeals to many students. Research at Manchester Metropolitan University, supported by MEI, indicates that this approach produces better development of conceptual understanding and improved performance among students who find it difficult to engage with mathematics at KS3 and 4 as it is traditionally presented English classrooms.

27 b) Considering your response to question 27a above, what features of their national curricula or wider education systems are most significant in explaining their success?

Comments: Their holistic understanding of student progress in mathematics is based on long term research and on seeing mathematics as something students do and use, rather than as a body of knowledge to be poured into them.

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

Comments:

SECTION H: HOW CHILDREN LEARN (Q29)

The remit for the review makes clear that the National Curriculum should express clearly the progression that pupils should make in each subject, and that this progression should be informed by the best available evidence on how children learn. For example, at what age should particular concepts first be introduced, how should these be sequenced in the most appropriate age-related order to develop deep learning and how should this evidence be best reflected in Programmes of Study for particular subjects?

This section is about your views on the best available evidence on how children acquire particular knowledge, and understanding of concepts and principles, to inform the development of the National Curriculum. Your views

may be based on particular research, expertise or from your own experiences of teaching.

Our aim in seeking this information is to help inform the sequencing of knowledge at different ages with the National Curriculum Programmes of Study. We would welcome all evidence relevant to this issue, whether broadly based or focused on particular knowledge and concepts within a given subject (eg understanding ratio and proportion within mathematics).

29 What research evidence on how children learn provides the most useful insights into how particular knowledge should best be sequenced within the National Curriculum Programmes of Study?

If drawing on particular research evidence, please provide a brief summary of the evidence, with a reference or web address to key studies or research summaries. Alternatively, you can email the evidence to: NCReview.DOCUMENTS@education.gsi.gov.uk and refer to it here.

Comments:
http://www.fi.uu.nl/publicaties/literatuur/6663.pdf looks at the compulsory content of Dutch primary and lower secondary education and how it was determined. It also gives an introduction to some of the research about levels of difficulty within calculation problems, including estimation problems. For example, the following order of difficulty is suggested for estimation problems
"(1) exploring and rounding off numbers,
(2) estimating in addition and subtraction problems,
(3) estimating in multiplication and division problems,
and (4) calculations with estimated values in problems where the necessary data are incomplete or unavailable."

SECTION I: TRANSITION (Q30- Q33)

The review will be taking into account the emerging conclusions of the review of the Early Years Foundation Stage (EYFS) by Dame Clare Tickell to ensure a smooth transition from the EYFS to Key Stage 1. The review will also take into account the need for the National Curriculum to be embodied readily into GCSE subject criteria and support the effective operation of public examinations at the end of compulsory schooling. The development of new GCSE criteria themselves is outside the scope of this review.

This section is about your views on how to best take into account the key transition periods in schooling in developing the new National Curriculum.

30 What are the most important factors to consider in developing the National Curriculum for Key Stage 1 to ensure a smooth transition from the Early Years Foundation Stage?

Comments:

31 What are the most important factors to consider in developing the National Curriculum for Key Stage 3 to ensure a smooth transition from Key Stage 2?

Comments:
Secondary mathematics teachers should liaise with teachers at feeder primary schools. This will give both phases a better insight into what is taught in the adjacent Key Stage than any documentation can.

32 What are the most important factors to consider in developing the National Curriculum for Key Stage 4 to ensure the effective operation of GCSE and other public examinations?

Comments:
It is essential to consider how students will progress after KS4 in order to ensure that they develop the skills which they will need to use in the future. See answer to question 25b.

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

Comments:

SECTION J: IMPLEMENTATION (Q34 - Q35)

This section is about what arrangements need to be put in place to support the successful implementation of the new National Curriculum in schools. For example, this may relate to teacher training, inspection, statutory assessment, support and guidance for schools, etc.

As explained in Section C, the Government's intention is that the implementation of the new National Curriculum should be phased in, with new Programmes of Study for English, mathematics, science and physical education published in autumn 2012 for first teaching in schools from September 2013, and those for other subjects published in autumn 2013 for first teaching in schools from 2014. The remit for the review includes

consideration of what further phasing may be necessary (for example whether the new Programmes of Study should be introduced in all key stages/year groups simultaneously, or over a period of time).

34 What are the particular issues that need to be considered in phasing the introduction of the new National Curriculum in the way proposed, with Programmes of Study in some subjects introduced in 2013 and the rest a year later?

Comments:
Teachers need to feel ready to teach the new national curriculum and to have appropriate high quality resources to enable them to do so. Ways need to be found of communicating the requirements of the new curriculum to teachers at a time when many local authority consultants have been made redundant.

It is the experience of students in classrooms which determines their mathematical understanding and their attitude to the subject. It is important that this experience is a positive one.

35 What other arrangements, if any, need to be considered in implementing the new National Curriculum, and how they should be addressed?

Comments:

SECTION K: OTHER ISSUES AND COMPLETING THIS CALL FOR EVIDENCE (Q36-Q37)

36 Please use this space for any other evidence or views you wish to feed into the review at this stage.

Comments:

37 Finally, please let us have your views on responding to this Call for Evidence (eg the number and type of questions, was it easy to find, understand, complete etc.)

Comments: It was helpful to have the questionnaire as an editable Word document; this facilitated discussions about our 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

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

XYes	☐No

All DfE public consultations are required to conform to the following criteria within the Government Code of Practice on Consultation:

Criterion 1: Formal consultation should take place at a stage when there is scope to influence the policy outcome.

Criterion 2: Consultations should normally last for at least 12 weeks with consideration given to longer timescales where feasible and sensible.

Criterion 3: Consultation documents should be clear about the consultation process, what is being proposed, the scope to influence and the expected costs and benefits of the proposals.

Criterion 4: Consultation exercises should be designed to be accessible to, and clearly targeted at, those people the exercise is intended to reach.

Criterion 5: Keeping the burden of consultation to a minimum is essential if consultations are to be effective and if consultees' buy-in to the process is to be obtained.

Criterion 6: Consultation responses should be analysed carefully and clear feedback should be provided to participants following the consultation.

Criterion 7: Officials running consultations should seek guidance in how to run an effective consultation exercise and share what they have learned from the experience.

If you have any comments on how DfE consultations are conducted, please contact Donna Harrison, DfE Consultation Co-ordinator, tel: 01928 738212 / email: donna.harrison@education.gsi.gov.uk

Thank you for taking time to respond to this consultation.

Completed questionnaires and other responses should be sent to the address shown below by 14 April 2011

Send by post to:
Department for Education
Consultation Unit Area Level 1 C
Castle View House
Runcorn
Cheshire
WA7 2GJ

Send by e-mail to: NCReview.RESPONSES@education.gsi.gov.uk

Appendix 1

A possible common core of content for the Statistics within GCSE Mathematics

This is intended to illustrate the level of detail which is required in the National Curriculum rather than to be a definitive list of content (see reponse to question 10a).

Statistics and probability

- understand and use the statistical problem solving process/handling data cycle
- design and perform an experiment or survey
- identify possible sources of bias
- recognise and deal with practical difficulties e.g. missing or incorrect data
- design and use data-collection sheets
- extract data from publications
- design, use and interpret two-way tables for discrete and grouped data
- compare distributions and make simple inferences
- produce charts and diagrams for various data types including bar charts, dot plots, pie charts, histograms, time series graphs, cumulative frequency graphs, box and whisker diagrams
- calculate median, mean, range, quartiles and inter-quartile range, mode and modal class and use them to compare data sets
- interpret a wide range of graphs and diagrams and draw conclusions
- recognise common errors in the presentation or interpretation of data
- use a scatter diagram and line of best fit to solve a problem
- interpret correlation (or lack of it) in a given context, understanding that correlation does not imply causation
- understand and use the vocabulary of probability and the probability scale, including the concept of risk
- understand and use measures of probability from theoretical models (including equally likely outcomes)
- count all outcomes for single events, and for two successive events, in a systematic way and derive related probabilities
- identify different mutually exclusive outcomes and know that the sum of the probabilities of all these outcomes is 1
- estimate probability by finding relative frequency and realise that a larger sample gives a better estimate of probability
- use tree diagrams to represent outcomes of compound events
- perform probability calculations involving one or more chance events, understanding that if A and B are mutually exclusive, then the probability of A or B occurring is P(A) + P(B), whereas if A and B are independent events, the probability of A and B occurring is P(A) × P(B)
- compare experimental and theoretical probabilities and comment on the theoretical model
- understand that if they repeat an experiment or survey, they may — and usually will — get different outcomes