

GCSE Engineering and GCSE, AS and A level Design and Technology consultation on Conditions and guidance

How to respond to this consultation

The closing date for responses is **20 January 2016**.

Please respond to this consultation in one of three ways:

- Complete the online response at www.surveygizmo.com/s3/2496122/GCSE-AS-and-A-level-reform-regulations-for-engineering-and-design-and-technology;
- Complete these consultation questions and email your response to consultations@ofqual.gov.uk. Please include the consultation title (Engineering and Design and Technology Consultation 2015) in the subject line of the email and make clear who you are and in what capacity you are responding; or
- Post your response to: Engineering and Design and Technology Consultation 2015, Ofqual, Spring Place, Herald Avenue, Coventry, CV5 6UB, making clear who you are and in what capacity you are responding.

Evaluating the responses

To evaluate responses properly, we need to know who is responding to the consultation and in what capacity. We will therefore only consider your response if you complete the information page.

Any personal data (such as your name, address and any other identifying information) will be processed in accordance with the Data Protection Act 1998 and our standard terms and conditions.

We will publish our evaluation of responses. Please note that we may publish all or part of your response unless you tell us (in your answer to the confidentiality question) that you want us to treat your response as confidential. If you tell us you wish your response to be treated as confidential, we will not include your details in any published list of respondents, although we may quote from your response anonymously.

Please respond by **20 January 2016**.

Responding to the consultation

Your details

To evaluate responses properly, we need to know who is responding to the consultation and in what capacity. We will therefore only consider your response if you complete the following information section.

We will publish our evaluation of responses. Please note that we may publish all or part of your response unless you tell us (in your answer to the confidentiality question) that you want us to treat your response as confidential. If you tell us you wish your response to be treated as confidential, we will not include your details in any published list of respondents, although we may quote from your response anonymously.

Please answer all questions marked with a star*

Organisation name (if applicable)*

The Design and Technology Association

Address

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Email

info@data.org.uk

Telephone

01789 470007

Would you like us to treat your response as confidential?*

If you answer yes, we will not include your details in any list of people or organisations that responded to the consultation.

Yes () No

Is this a personal response or an official response on behalf of your organisation?*

Personal response (please answer the question 'If you ticked "Personal response"...')

Official response (please answer the question 'If you ticked "Official response"...')

If you ticked "Personal response", which of the following are you?

- Student
 - Parent or carer
 - Teacher (but responding in a personal capacity)
 - Other, including general public (please state below)
-

If you ticked "Official response", please respond accordingly:

Type of responding organisation*

- Awarding organisation
- Local authority
- School or college (please answer the question below)
- Academy chain
- Private training provider
- University or other higher education institution
- Employer
- Other representative or interest group (please answer the question below)

NB. To aid the analysing of responses submitted as part of this consultation, this response has been completed in consultation with DandTforDandT. Separate responses have been submitted. Both responses are similar and in broad agreement with one another.

School or college type

- Comprehensive or non-selective academy
- State selective or selective academy
- Independent

- Special school
 - Further education college
 - Sixth form college
 - Other (please state below)
-

Type of representative group or interest group

- Group of awarding organisations
- Union
- Employer or business representative group
- Subject association or learned society
- Equality organisation or group
- School, college or teacher representative group
- Other (please state below)

Nation*

- England
- Wales
- Northern Ireland
- Scotland
- Other EU country: _____
- Non-EU country: _____

How did you find out about this consultation?

- Our newsletter or another one of our communications
- Our website
- Internet search

Other

May we contact you for further information?

Yes No

Questions

Question 1: To what extent do you agree or disagree that – for each of GCSE design and technology, GCSE engineering and AS and A level design and technology – we should introduce a Condition which requires exam boards to comply with the relevant subject content and assessment objectives??

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

A Condition which requires exam boards to comply with the relevant subject content and assessment objectives is essential if the underpinning spirit and intention of these qualifications is to be upheld. We see these conditions as fundamental in protecting the interests of the subject and as an instrument to maintain parity across the different Awarding Organisation's individual specifications offered under the same title.

Question 2: To what extent do you agree or disagree with our proposed approach to interpreting the subject content requirements for equations in GCSE engineering?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

Engineers in the world outside school use equations and results derived from equations to make design decisions. Hence it is important that pupils are introduced to this aspect of the subject. However, it is important that this does not become onerous or over demanding; in particular the mathematical demand of an engineering GCSE paper should be no more than the demand of a mathematics GCSE paper. Hence we have opted for agree rather than strongly agree.

Question 3: To what extent do you agree or disagree that – for each of GCSE design and technology, GCSE engineering and AS and A level design and technology – we should introduce guidance which clarifies how exam boards should interpret our assessment objectives?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

The way specifications for D&T and engineering are assessed, significantly affects the way they are taught and the nature of the educational activity that takes place leading up to assessment. We know this from experience of different versions of GCSE courses being implemented, since the mid-1980s. The assessment objectives as they are written, do not provide sufficient clarity to ensure that they are interpreted uniformly by the by different Awarding Organisations so it is essential that further detail is provided.

Question 4: To what extent do you agree or disagree that we should introduce rules for exam assessment to ensure exam boards take a consistent approach to assessing mathematical skills in GCSE engineering?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

As indicated in our response to Question 1 it is essential to maintain parity of demand, consistency and rigour across specifications offered by different Awarding Organisations. Rules to ensure a consistent approach to assessing mathematical skills are an important device to achieve this.

Question 5: To what extent do you agree or disagree that we should introduce rules for exam assessment to ensure exam boards take a consistent approach to assessing mathematical and scientific skills in GCSE, AS and A level design and technology?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

The use of mathematical and scientific skills is an important aspect of making design decisions. This is not to deny the importance of intuition but decisions based on intuition need to be validated where appropriate by the use of mathematics and science. As indicated in our response to Question 1 it is essential to maintain parity of demand, consistency and rigour across specifications offered by different Awarding Organisations. Rules to ensure a consistent approach to assessing mathematical and scientific skills are an important device to achieve this.

Question 6: To what extent do you agree or disagree with our proposed approach to assessing mathematical skills (including our approach to the 15 per cent minimum weighting) for GCSE engineering?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

As indicated in our response to Question 2 use of mathematics is an essential aspect of engineering. Hence it is important to support this with a minimum assessment requirement.

Question 7: To what extent do you agree or disagree with our proposed approach to assessing mathematical skills (including the proposed 10 per cent minimum weighting) for GCSE design and technology?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

As indicated in our response to Question 5 we think the use of mathematics to inform design decisions is an important aspect of design & technology. Hence it is important to support this with a minimum assessment requirement. Also the insistence on Key Stage 3 mathematics as a minimal level of demand is important, as all candidates will have studied the KS3 programme of study for mathematics. It is important that the upper level should be no more demanding than GCSE maths.

Question 8: To what extent do you agree or disagree with our proposed approach to assessing mathematical skills (including the proposed minimum weightings) for AS and A level design and technology?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

It is essential to maintain and extend the use of mathematics skills in the progression from GCSE to AS and A level and also to reflect the different demand for this within the different endorsed routes. However, the level of mathematical skill demanded by the specifications must again not exceed that of GCSE. Progression in the level of sophisticated application to which mathematical skills are applied is to be expected but it should not be the case that further mathematical knowledge, skills and understanding (such as those associated with the content of mathematics A level)

are assessed. This would place additional burden on the amount of content needed to be covered by all students.

Question 9: To what extent do you agree or disagree with our proposed approach to assessing scientific knowledge, skills and understanding in GCSE, AS and A level design and technology?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

We have already stated our belief in the importance of using scientific knowledge, skills and understanding in design & technology but we do have a minor concern as to the extent to which there will be parity of demand across the specifications with the requirement for justification as opposed to a particular given percentage of marks, hence the 'Agree' category above. It will be important the Ofqual scrutinises these justifications strongly.

Question 10: To what extent do you agree or disagree that – for each of GCSE design and technology, GCSE engineering and AS and A level design and technology – we should introduce a Condition which permits non-exam assessment, specifies the proportion of exam- and non-exam assessment, and allows us to set more detailed rules and guidance on non-exam assessment?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

We believe that it would be impossible to assess both subjects by examination alone. Activity that by its very nature cannot take place under the normal constraints imposed by examination conditions is fundamental to them. It can only take place where a variety of practical processes can be utilised, often requiring specialist environments, over longer periods of time than that of a typical examination and with time for reflection built in. It therefore follows that any assessment of this activity,

adopts an alternative assessment methodology to the more traditional style examination. This feature is long established in these and other subjects and we see no reason for it to be changed.

Question 11: To what extent do you agree or disagree with our proposed approach to allocating non-exam assessment marks to assessment objectives in GCSE engineering?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

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As the nature of this qualification is about practical application of engineering theory and manufacturing processes and responding using knowledge of these to address set briefs, we would agree with the proposal to apportion the available marks in this way. We would want to see that those marks associated with AO3, evaluation were not restricted to final examination of the prototype manufactured but also addressed the use of evaluation as development took place.

Question 12: To what extent do you agree or disagree with our proposed approach to setting the brief(s) for non-exam assessment in GCSE engineering?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

Compared to the requirements for D&T, our understanding is that the emphasis is placed not on the process of identifying opportunities within which design and making can take place, but rather on a more limited perspective, requiring students

to respond to briefs. We would agree that identifying appropriate briefs is generally best done at Awarding Organisation not school level. That said, as has been the case to date with some D&T specifications, we would welcome the opportunity for schools to present alternative briefs for consideration by the respective Awarding Organisation. This would allow for students who had identified a brief for themselves to take it forward with real benefit.

We also agree that several briefs should be set each year allowing for flexibility. It will be challenging however to achieve an approach that both 'minimises predictability of the products students produce' and reconciling this with any requirement that may be included in the brief, requiring demonstration of the use of particular skills and processes. The latter might make comparison of different student outcomes simpler but would not necessarily promote striving for innovative outcomes.

Question 13: To what extent do you agree or disagree with our proposal that the briefs for non-exam assessment in GCSE engineering should be released no earlier than 1 June in the year before the qualification is to be awarded?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

We strongly agree with this proposal. It will prevent teaching being focussed predominately on the assessed element of the course rather than encouraging the development of a broad range of experience through addressing a variety of tasks and challenges. It emphasises the distinction between covering the specification of the purposes of learning and simply meeting the assessment requirements.

Question 14: To what extent do you agree or disagree with our proposed approach to allocating non-exam assessment marks to assessment objectives in GCSE design and technology?

- Strongly agree
- Agree

() Neither agree nor disagree

(✓) Disagree

() Strongly disagree

Please explain your reasons:

The table below shows a comparison between the NEA and Written Paper assessment objectives.

	Objective	Weighting	NEA	Written Paper
AO1	Identify, investigate and outline design possibilities to address needs and wants	10%	10%	0%
AO2	Design and make prototypes that are fit for purpose	30%	30%	0%
AO3	Analyse and evaluate – <ul style="list-style-type: none">• design decisions and outcomes, including for prototypes made by themselves and others• wider issues in design and technology	20%	10%	10%
AO4	<ul style="list-style-type: none">• Demonstrate and apply knowledge and understanding of –technical principles• designing and making principles	40%	0%	35% 5%
Totals		100%	50%	50%

We are content with the 50%:50% split between the NEA and the written paper. We agree that AO1 and AO2 should not be assessed via the written paper. We see that analysis and evaluation can sensibly be assessed within the NEA AND the written paper, with an assessment of the design decisions and outcomes made by others and the wider issues in design & technology lending themselves more to the written paper than the NEA, hence the suggested split of the AO3 allocation in the table above. It is with AO4 that we have some difficulty. The strand concerned with “*demonstrate and apply knowledge and understanding of designing and making principles*” opens the way for Awarding Organisations to set time pressured pencil and paper design tasks in the written paper when such tasks do not adequately assess design ability and the ability to design is more than adequately assessed in the AO2. We also think that the whole business of designing and making as described by the designing and making principles is adequately assessed by the combination of AO1, AO2 and AO3 and there is the risk that the assessment of knowledge and understanding of technical principles is under represented.

We think that Ofqual is aware of this possibility hence the statement under interpretations and definitions “*The emphasis in this assessment objective should be on the demonstration and application of knowledge and understanding of technical principles*”. We wonder if this sentence is sufficiently strong and suggest the following

“It is important to stress that the demonstration and application of knowledge and understanding of technical principles should be significantly emphasised in this assessment objective”.

To support this, we suggest the split allocation of AO4 between the technical and the designing and making principles shown in the table above.

Question 15: To what extent do you agree or disagree with our proposal that the contextual challenges for non-exam assessment in GCSE design and technology should be released no earlier than 1 June in the year before the qualification is to be awarded?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Please explain your reasons:

As with engineering (response to Q13), it is important that candidates do not start the NEA too soon. Their performance in the NEA should be informed by as much prior learning as possible. i.e. the learning that takes place in Year 10. Putting the release date on 1st June at the earliest will prevent schools spending too much Year 10 time tackling the NEA. This date still provides sufficient time to schedule completion of NEA activity and avoid clashes with other EBac subjects that frequently compete for additional school time, often to the detriment of D&T.

Question 16: To what extent do you agree or disagree with our proposed approach to allocating non-exam assessment marks to assessment objectives in AS and A level design and technology?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree

Strongly disagree

Please explain your reasons:

We would agree that all of the marks available under A01 and AO2 should be allocated to NEA. We also agree that it is possible that allowing flexibility within the endorsed routes to, as appropriate, place different emphasis on design and production skills could be advantageous. Therefore, the variation in the weightings is welcomed and hopefully will provide the encouragement to Awarding Organisations to be creative in their proposals. Students evaluating their own work throughout the process of designing and developing prototypes is an essential activity and integral to D&T. So to allocate up to 20% of the marks to AO3 is appropriate and can be assessed best within the NEA submission.

Question 17: To what extent do you agree or disagree with our proposed approach to authenticating non-exam assessment in GCSE engineering and GCSE, AS and A level design and technology?

Strongly agree

Agree

Neither agree nor disagree

Disagree

Strongly disagree

Please explain your reasons:

Requiring teacher presence to authenticate students' work is highly appropriate. However, whilst we understand that remote presence authentication is in support of teacher presence we feel that this might be very difficult to carry out in practice.

Question 18: To what extent do you agree or disagree with our proposed approach to marking of non-exam assessment in GCSE engineering, and GCSE, AS and A level design and technology?

Strongly agree

Agree

Neither agree nor disagree

Disagree

Strongly disagree

Please explain your reasons:

We welcome the acknowledgement that those responsible for the marking the NEA should be those who have been involved with and observed the candidates working and hence have the necessary insight into their progress and achievement. We also welcome the freedom of 'evidencing' and the possibility to move away from a portfolio approach. We recommend that Ofqual take note of the paper (see https://ojs.lboro.ac.uk/ojs/index.php/DATE/article/view/Journal_12.2_0707_RES4) written by Barlex in 2007 'Assessing capability in design & technology The case for a minimally invasive approach" *Design and Technology Education: An International Journal*, 12.2, 9 – 56, Design & Technology Association, Wellesbourne, ISSN 1360-1431

We would also encourage the opportunity this review provides to explore the use of paired assessment, building on the work of the TERU research unit at Goldsmiths College University of London, and its e-scape project. <http://www.gold.ac.uk/teru/>

Question 19: Do you have any comments on our proposed Conditions and requirements for GCSE engineering?

Yes No

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Question 20: Do you have any comments on our proposed guidance for GCSE engineering?

Yes No

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Question 21: Do you have any comments on our proposed Conditions and requirements for GCSE design and technology?

Yes No

We strongly welcome the statement indicating that the Awarding Organisations are required to consider the content of the subject as indicated in DFE-00283-2015

Question 22: Do you have any comments on our proposed guidance for GCSE design and technology?

Yes () No

We strongly welcome the statement indicating that Ofqual might produce revisions of guidance to Awarding Organisations (*An awarding organisation must ensure that in respect of each assessment for a GCSE Qualification in Design and Technology which it makes available it complies with any requirements, and has regard to any guidance, which may be published by Ofqual and revised from time to time*).

It would be helpful, in the table on p47 detailing AO3, to indicate that there is an expectation that “Analyse and evaluate design decisions and outcomes, including for prototypes made by themselves and others” should be largely assessed through NEA and that “Analyse and evaluate wider issues in design and technology” should be assessed through examination.

We agree that in AO4 “The emphasis in this assessment objective should be on the demonstration and application of knowledge and understanding of technical principles.”, since knowledge and understanding of designing and making principles is also represented via the other AOs through the NEA. However, we suggested in our response to Q14 (above) a stronger version of this statement:

“It is important to stress that the demonstration and application of knowledge and understanding of technical principles should be significantly emphasised in this assessment objective”.

Question 23: Do you have any comments on our proposed Conditions and requirements for AS and A level design and technology?

() Yes (✓) No

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Question 24: Do you have any comments on our proposed guidance for AS and A level design and technology?

() Yes (✓) No

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Question 25: We have not identified any ways in which our proposals for GCSE engineering, and for GCSE, AS and A level design and technology would impact (positively or negatively) on persons who share a protected characteristic.¹ Are there any potential impacts we have not identified?

Yes No

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Question 26: Are there any additional steps we could take to mitigate any negative impact resulting from these proposals on persons who share a protected characteristic?

Yes No

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Question 27: Do you have any other comments on the impacts of the proposals on students who share a protected characteristic?

Yes No

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¹ 'Protected characteristic' is defined in the Equality Act 2010. Here, it means disability, racial group, age, religion or belief, pregnancy or maternity, sex, sexual orientation and gender reassignment.

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Accessibility of our consultations

We are looking at how we provide accessible versions of our consultations and would appreciate it if you could spare a few moments to answer the following questions. Your answers to these questions will not be considered as part of the consultation and will not be released to any third parties.

We want to write clearly, directly and put the reader first. Overall, do you think we have got this right in this consultation?

Yes No

Do you have any comments or suggestions about the style of writing?

Yes No

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Do you have any special requirements to enable you to read our consultations? (for example, screen reader, large text, and so on)

Yes No

Which of the following do you currently use to access our consultation documents? (select all that apply)

Screen reader / text-to-speech software

Braille reader

Screen magnifier

Speech-to-text software

Motor assistance (blow-suck tube, mouth stick, and so on)

Other

Which of the following document formats would meet your needs for accessing our consultations? (select all that apply)

- A standard PDF
- Accessible web pages
- Large-type PDF (16 point text)
- Large-type Word document (16 point text)
- eBook (Kindle, iBooks, or similar format)
- Braille document
- Spoken document
- Other

How many of our consultations have you read in the last 12 months?

- 1
- 2
- 3
- 4
- 5
- More than 5