



## **ACME response to the Department for Education Consultation on Key Stage 4 Qualification Reform**

### **About ACME**

The Advisory Committee on Mathematics Education (ACME) is an independent committee, based at the Royal Society and operating under its auspices, that aims to influence Government strategy and policies with a view to improving the outcomes of mathematics teaching and learning in England and so secure a mathematically enabled population. ACME acts as a single voice for the mathematics community.

### **About this response**

Our response to this consultation has been informed by a symposium organised jointly by ACME and the Oxford University Centre for Educational Assessment. Attendees at the meeting discussed the DfE's proposals and their implications for mathematics. The meeting included a wide range of teachers, Higher Education representatives and other stakeholders including all the major Awarding Organisations. The response was also informed by our Outer Circle of advisors and by a discussion document on the Key Stage 4 qualifications reform, written by an ACME member. ACME's response focuses on issues related to mathematics education.

### **In summary:**

- **The Key Stage 4 qualifications reform represents an opportunity to ensure that mathematics assessment is valid as well as reliable, by assessing what is valued in mathematics such as problem solving in both familiar and unfamiliar contexts, extended reasoning, development of algebraic skills and numerical computational skills, understanding of probability and risk, modelling, etc.**
- **ACME is concerned about the process suggested to implement a new Key Stage 4 qualification. The timeframes especially risk producing low-quality outcomes. There is an urgent need for policy coherence across the National Curriculum Review from KS1 to KS4, the Key Stage 4 qualification and A level reforms, as well as the accountability reforms and the drive to increase the number of students taking mathematics post-16.**
- **ACME believes that the purpose of a qualification should frame its design and is surprised that there is no discussion of the purpose of the proposed EBC qualification in the consultation.**
- **ACME advises that the Department for Education should ensure that the drive to raise achievement focuses on an expectation of greater in-depth mastery of mathematical ideas and concepts rather than on adding extra content.**

- **The Department for Education should take into account the lessons learned from the GCSE Mathematics Linked Pair Pilot when designing the EBC. These are outlined in our response.**
- **There is a broad consensus within the mathematics community that having no tiering in mathematics is neither feasible nor desirable in the immediate future.**
- **There is general support within the mathematics community for the introduction of an Additional Mathematics Qualification, as long as the content and structure are considered carefully and are based on the principles outlined in ACME's paper on developing able young mathematicians.**
- **ACME believes that there are serious issues with the franchising proposals outlined in the consultation, which the Department for Education should consider carefully.**

### **ACME response:**

ACME welcomes the opportunity to respond to this consultation and we support the government in its drive to improve the quality of Key Stage 4 qualifications and to raise the attainment of all students. However, ACME is concerned that the proposals outlined in the consultation document are sometimes contradictory and therefore unclear and thus make it difficult to give useful and informed advice. In addition, the proposals, as well as the consultation itself, fail to address important issues relating to mathematics qualifications at Key Stage 4, such as the purpose of the qualification and whether the assessment instruments need to be improved.

### **Process**

ACME is concerned about the process proposed by the Government for creating the EBC in mathematics, and the timescale on which this is expected to operate. In order to ensure that the new qualification is high quality and fit for purpose, a number of decisions need to be made and processes put into place before organisations develop the qualification:

- A National Curriculum Programme of Study for Key Stages 1-4 should be approved and piloted, so that Awarding Organisations have an understanding of the level and range of content a student will have met prior to Key Stage 4 Assessment.
- There should be an agreed core content for the EBC in mathematics, which should be the same as the proposed National Curriculum for Key Stage 4, which in turn needs to be submitted to national consultation. This would ensure that the competing organisations develop a new qualification that is based on the same agreed content and aims. The current timescale indicates that this content may not be agreed until after the award of the franchise, which is not helpful. If the selected Awarding Organisation were to define the content of Key Stage 4, there is a risk that this content could lack coherence with Key Stages 1-3 and then be rejected by national consultation, which would create significant delays in the whole process.
- The selected organisation should be briefed fully as to the desired aims of the curriculum, so that the EBC assesses what is valued in mathematics.

- There should be agreed reform plans for all post-16 pathways in mathematics but in particular for A levels in Mathematics and Further Mathematics, in order to ensure continuity and progression throughout school mathematics.
- Any further conditions from Ofqual regarding the design rules for the EBC should be decided before the bidding process, particularly regarding what is most appropriate for mathematics and what is not appropriate for mathematics.
- The rules for the competition for the franchise will need to be outlined.
- The principles of the reformed approach to accountability will need to be established, so that Awarding Organisations can ensure that their qualifications support good teaching and learning in the classroom, and don't create perverse incentives.

At present the only fixed date is the proposal to have qualifications in schools by September 2014, and we understand that this would mean the final contract would need to be awarded in January 2014. It also seems that much of the information the competing organisations will require in order to develop, fairly and effectively, their proposed qualification will not be available until March 2013 at the earliest. Finally, there is likely to be a deadline for submission to Ofqual, around June 2013. This means that the competing organisations will have to start to develop their new qualification with very limited information. **It is therefore clear that the amount of time allocated for the development of these radically new qualifications, with many new features that present several challenges, is inadequate; it is highly probable that it will lead to an unsatisfactory outcome.**

The Government should consider implementing changes in a more gradual way, in line with the practices of high performing jurisdictions, to ensure that the system, including students, schools and teachers, is allowed to cope successfully with the changes, especially to avoid endangering the progress accomplished in the last few years in terms of access to the full range of mathematically-valued outcomes and progression to post-16 mathematics.

In addition, ACME notes that a new qualification will need to be supported with new resources and sufficient CPD to allow teachers to teach the new qualification confidently, particularly if the underlying aim is significantly higher aspirations in terms of fluent and rigorous mathematical capacity. Teachers will need to participate in sustained, subject specific professional development, which takes time and does not seem to have been factored into the proposed timeframe. In addition, writing good textbooks is a challenging task which requires time and sufficient testing to ensure high quality; this should be taken into account when implementing a new qualification.

We therefore strongly **recommend that the government reconsiders the timescale of the reform.**

### **Policy coherence**

ACME has argued in the past that education policy changes should be considered as a whole to ensure coherence between phases. The links between the proposals for the English Baccalaureate Certificate development, Key Stage 1 to Key Stage 3 reform, and post-16 reform must be made very clear. ACME is concerned that each of these is being

considered in isolation and that this lack of coherence will result in a fragmented mathematics education for young people.

As the proposals stand, the curriculum would be particularly fragmented, with Key Stage 1 to 3 being owned by the Department for Education, Key Stage 4 being effectively led by one Awarding Organisation (potentially radically changed every 5 years) and Key Stage 5 being controlled by various Universities and the Awarding Organisations.

The accountability reforms are also closely linked to the English Baccalaureate Certificates. Currently, school accountability relies heavily on the number of students achieving A\* to C grades at GCSE. Accountability measures should therefore be reformed in conjunction with the new KS4 qualifications, especially if they are to play a similar role to the current GCSE.

A level reforms are currently being developed but again the reforms need to be thought through alongside the English Baccalaureate Certificates consultation. First, it is very difficult for the different stakeholders to analyse the effect of the proposed changes without having a clear idea of what the next steps will look like for students taking the EBCs. In mathematics especially, the current GCSE acts as a gatekeeper to further education and employment and if the proposed qualification is to fulfil the same role, the DfE must ensure that progression is enabled and encouraged. In addition, from the point of view of Awarding Organisations, the development time for EBCs and A levels currently overlaps, making it impossible for them to ensure coherence between the two.

### **Purpose of the qualification**

ACME is clear that the purpose of a qualification should frame its characteristics and design. The current mathematics GCSE has many purposes, which include that of a gatekeeper for employment and further and higher education. It also acts as an accountability measure for schools. ACME notes that there is no discussion of the purpose of the proposed EBC qualification in the consultation. We are surprised at this omission, given that young people will be expected to continue with education and training until the age of 18, which some argue makes assessment of all at 16 obsolete. Ofqual's letter to the Secretary of State highlights some of the implied purposes that the Government envisages this qualification will fulfil. ACME agrees with Ofqual's assessment that these purposes cannot all be fulfilled by the EBC.

ACME believes that, at the moment, a Key Stage 4 qualification should be a certificate of achievement in the KS4 curriculum. It should measure what a range of students can do in any given subject, at a particular point in time. ACME however recommends that in the long term this purpose should be reassessed as it might not be necessary to have high stakes assessment at 16 for all.

Even though there will inevitably be an EBC 'pass' level or cut off point, it is important that the range of hard-won achievements beyond and before that pass level are also valued. In mathematics, the Key Stage 4 qualification should act as a springboard for different pathways post-16 in mathematics. The qualification should not merely assess competence to proceed to A level mathematics but should also summarise the current state of progress and indicate the next steps in mathematics-related subjects and mathematical skills for all, including those who will progress to other post-16 mathematics pathways or take up

employment. To be useful to stakeholders of different types a range of outcomes must be possible with a broad guide to what students at different grades might be expected to have mastered.

However we are aware that, as they are intertwined with the rest of the education landscape, any qualification can end up attempting to fulfil more than one purpose at the same time, which is the case with the current GCSEs. We would therefore urge the government to ensure that the KS4 reform takes place in conjunction with reforms to accountability measures, as without this interaction the higher purposes of assessment reform will not be achieved.

### **Relationship between curriculum, assessment and teaching and learning**

The government's White Paper on education, published in 2010<sup>1</sup>, asserted that the National Curriculum should inform the design and content of assessment, rather than the other way around, and ACME welcomed this statement. We are therefore concerned that the new Key Stage 4 qualifications could be produced before the development of the National Curriculum at Key Stage 4 has been completed. We agree that in practice, secondary schools (most of which are likely to become Academies and will not have to follow the National Curriculum) will develop their school curriculum (at least in Key Stage 4) on the basis of the specifications for the qualifications. However, the Key Stage 4 curriculum should be a statement of entitlement for all young people and as such, the proposed qualifications should be based on the agreed core content outlined in the National Curriculum, which builds on the Key Stage 3 curriculum and provides a strong foundation for progression to further study or otherwise.

As stated in our response to the draft Mathematics Primary Curriculum<sup>2</sup>, and our study of the mathematical needs of universities and employers<sup>3</sup>, ACME would like to see a greater focus on problem solving, statistics, mathematical reasoning and modelling at all levels. These should be reflected in the aims and guidelines at Key Stage 4. The Department for Education should also consider the possibility of having qualifications which are bigger than the current GCSE in mathematics, English and Science. The linked pair GCSE in mathematics has shown the value of bigger assessment space, with at least comparable curriculum time, not only in terms of incorporating those desired characteristics but also in terms of giving equal importance to these subjects (see section on assessment).

### **Raising Achievement**

The consultation makes it clear that the new qualification will aim to raise expectations for young people, and ACME agrees with this aim. However, raising expectations is not synonymous with increasing the amount of content in a curriculum or qualification. We urge the Government to consider carefully the possible risks in adding significant content to Key

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<sup>1</sup> The Importance of Teaching:

<http://www.education.gov.uk/schools/toolsandinitiatives/schoolswhitepaper/b0068570/the-importance-of-teaching>

<sup>2</sup> ACME response to the draft Mathematics Primary Curriculum: <http://www.acme-uk.org/news/news-items-repository/2012/8/acme-response-to-draft-primary-curriculum>

<sup>3</sup> Mathematics in the workplace and in Higher Education: [http://www.acme-uk.org/media/7624/acme\\_theme\\_a\\_final%20\(2\).pdf](http://www.acme-uk.org/media/7624/acme_theme_a_final%20(2).pdf)

Stage 4. There is evidence<sup>4</sup> that when extra content is added, it can exacerbate 'teaching to the test' and prevent teachers from focusing on valued but more difficult topics, such as problem solving.

Raising achievement should focus instead on an expectation of greater in-depth mastery of mathematical ideas and concepts; these changes should be implemented gradually to ensure that the system can cope successfully. This would result in a population with a better understanding of mathematics and greater confidence to use it<sup>5</sup> in employment and everyday life.

## **Assessment**

### *Quality and validity of assessment*

The Key Stage 4 qualifications reform provides an opportunity to ensure that the assessment at this level is valid as well as reliable. We must move away from a focus on the end grade and towards a focus on learning, evidencing of achievement and ensuring a good foundation for progression.

One of the main criticisms of GCSE Mathematics has been the quality of the assessment. However the linked pair pilot and, to a lesser extent, the new single GCSE have shown that it is possible to create an assessment that better measures what is valued in mathematics, such as problem solving, which is one of the aims of the draft National Curriculum for mathematics. ACME believes that Awarding Organisations should be strongly encouraged to build on this valuable work.

The consultation suggests that the predictability of the assessment should be decreased and that the EBCs should assess every part of the curriculum. While ACME welcomes this move, changes should be gradual as a steep change would risk demotivating students and reducing the number of young people who choose to continue with mathematics post-16.

The consultation recommends that the new qualification should be 100% externally assessed. ACME would again like to draw the attention of the Department for Education to such initiatives as the assessment of the linked pair GCSE in mathematics, which allowed greater validity, in order to ensure that aspects of mathematics that are more difficult to assess in a standard written paper are well assessed. ACME recommends that the Department for Education should also investigate different types of assessment to ensure that all key aspects of mathematics are properly assessed.

ACME has strongly argued in the past for the need to eliminate early and multiple entry at GCSE<sup>6</sup>, which are often detrimental to students' learning of mathematics and preparation for further study. We therefore believe that the new Key Stage 4 qualification should only be taken at the age of 16, perhaps with the opportunity for a single resit. Separate arrangements should be made for post-16 students (see section below).

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<sup>4</sup> Evaluating Mathematics Pathways report:

<https://www.education.gov.uk/publications/eOrderingDownload/DFE-RR143.pdf>

<sup>5</sup> Ofsted, Mathematics: Understanding the score (2008), Mathematics: Made to Measure (2012)

<sup>6</sup> ACME, Early and Multiple Entry to GCSE: <http://www.acme-uk.org/media/7392/early%20and%20multiple%20entry%20to%20gcse%20final.pdf>

### *Lessons learned from the linked pair of GCSEs in Mathematics pilot*

The GCSE Mathematics Linked Pair Pilot has shown the value of having greater assessment space, in order to assess the range of mathematics topics, which result in teaching and learning closer to curriculum intentions<sup>7</sup>. In the linked pair, this was achieved by having separate assessment in each of Methods in mathematics and Applications of mathematics. The separate focus of the assessment changed the balance of teaching and learning in some classrooms, to that more aligned with curriculum intentions and ACME believes it is important to build on this. Although a structure that encourages separate teaching of these two strands is not necessarily the best way forward, it is important to adopt a model where each is seen as equally valued and weighted. Other valuable lessons from the Linked Pair which should be taken into account when reforming Key Stage 4 qualifications include:

- Greater assessment time means more valid and reliable assessment.
- Two exams means greater value placed on the subject by a range of stakeholders, who see it as equivalent to English and science. This could also be achieved by having a single, large EBC for English, Mathematics and Science, with comparable (possibly increased) curriculum time and value.
- Extra content requires extra teaching time.
- Awarding Organisations working together results in better assessment, even in a competitive situation.
- Quality teacher support and resources significantly improves teaching quality.
- Time is needed to develop better assessment and teaching practice; one should not expect big changes overnight.

### *Grading*

The consultation proposes that the grading system could be changed; it also suggests that different grading systems could be used for different subjects. Having such a system in place would completely undermine any comparisons between different subjects as well as between countries. ACME believes that the new system should be simple and easy for teacher, parents/carers, universities, employers, schools, colleges and students to understand and use. Therefore, we suggest that the grading system needs to be the same for all subjects.

### **Tiering**

ACME is very concerned about the Government's proposals to eliminate tiering in mathematics. Whilst we understand that the current tiering framework has on occasion been

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<sup>7</sup> Alpha Plus, Evaluation of the Linked Pair Pilot (2012):  
<https://www.education.gov.uk/publications/RSG/publicationDetail/Page1/DFE-RB241>

misused to limit aspiration, we have grave reservations about the impact of having a single paper for all grades in mathematics.

Mathematics assessment is different to that in other subjects as it differentiates by task and not by outcome. In other subjects, the questions can be the same for all students; the mark scheme indicates how different responses should be evaluated. In mathematics examinations, on the other hand, questions at quite different standards are set for candidates of different attainments. In mathematics especially, there is a very broad range of attainment at Key Stage 4. For these reasons, a single paper for all grades is impracticable, as weaker candidates would be faced with challenging questions they could not begin, and strong candidates would waste time working through questions that present them with no challenge whatsoever; this would also make for an exceptionally long paper. It would therefore be very difficult to design a valid examination which would reliably assess the learning of all, or even 90%, of students at age 16.

Finally, there is currently no expertise in Awarding Organisations' mathematics teams in how to set and mark such a paper so that it delivers reliable outcomes across the grade range. **Consequently, there is a broad consensus within the mathematics community that having a single paper for all grade ranges is neither feasible nor desirable in the immediate future.**

An alternative proposal that could address the issues outlined in the consultation would be that of a three-level system, where students are entered for two adjacent sets of papers. The Key Stage 4 qualification might be assessed at say Foundation level, Standard level and Higher level. All students would sit the Standard papers and either the Foundation or Higher paper. Thus all students would have examinations where they could demonstrate positive achievement, as well as being stretched. This system would also allow students to sit common Standard level papers which would permit comparison to be made between all students. Each level would need to test both methods and application aspects of the subject. ACME believes that in order to maximise each student's potential to achieve at the highest level, it would be crucial that the final decision about which level would be sat by each individual be left until as late as possible in KS4. Students develop at different rates and, in the short-term, many KS3 students will continue to be taught by non-specialists; for some young people, KS4 will be the first opportunity to experience specialist teaching. In addition, in order to ensure that such a model does not put a cap on expectations, it should ensure that a student who did very well in Foundation and Standard papers should be able to bridge to A level mathematics.

All levels in ACME's proposed model should incorporate a focus on increasing breadth and depth of concept. Standard and Higher papers could have a significant, and increasing, weighting towards algebra and formal reasoning and rigour, in addition to more sophisticated applications. This would help to encourage good teaching practices as recommended by Ofsted.<sup>8</sup> In addition, such a model could provide a more focused assessment, which would promote greater reliability.

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<sup>8</sup> Ofsted, Mathematics: Made to measure (2012): <http://www.ofsted.gov.uk/node/19157>

ACME is aware that a similar model was piloted by OCR in 2005 and subsequently rejected. However, we think it right that the model should now be given further consideration.

### **Additional Mathematics and supporting able mathematicians**

ACME welcomes the introduction of an Additional Mathematics qualification at Key Stage 4 - there is a general support for this proposal within the mathematics community, as long as the content and structure of the qualification are considered carefully. In particular, this additional qualification must be one that focuses on increasing the depth of learning of the Key Stage 4 curriculum. It should be challenging but it should not be a form of acceleration or introduce a significant amount of additional content. The content of the qualification should focus on using mathematical understanding to solve problems in unfamiliar contexts, mastery of algebraic technique and greater rigour in argument and proof. ACME believes, and is supported by Ofsted<sup>9</sup>, that in depth understanding and mastery of Key Stage 4 mathematics is a better preparation for level 3 study than superficial understanding of content included in AS or A-level. It is important, if we aim to build up competency and effective confidence in mathematics in young people, that Additional Mathematics be taught in an integrated way with the EBC as intended and examined co-terminally, so that able young mathematicians at 16 can demonstrate a deep mastery of EBC material.

There should be an expectation that Awarding Organisations will offer Additional Mathematics but the qualification should not be part of the accountability system. In the interest of accessibility, the qualification must be offered by all schools and it should be set at a level that makes teaching for it accessible to at least 30% of the national cohort and possible for at least 20% of the cohort to undertake formal assessment. ACME is currently working on a position statement on developing able young mathematicians, which argues for enrichment rather than acceleration for high achieving students. A qualification like the proposed Additional Mathematics could fit very well with the principles in the paper. ACME recommends that Ofqual and the Department for Education consult the principles of the ACME paper when developing the design rules for the Additional Mathematics Qualification. In addition, in order for such a qualification to succeed, the Department for Education should ensure that proper mechanisms are in place to ensure that it does not encourage early entry for EBC, which would undermine curriculum intentions.

### **Mature Key Stage 4 qualification**

Approximately 34% of students currently do not achieve at least a C grade at GCSE Mathematics by the end of Key Stage 4. The DfE's proposals imply that the requirements to get an EBC would be raised under the new system. ACME is concerned that if this were the only qualification with currency, it would condemn even more students to failure and the apparent prospect of endless retaking of the same qualification. As more young people will stay in education until at least 18, the numbers involved are likely to increase sharply. ACME has often argued<sup>10</sup> that repeated taking of the same qualification is both demotivating and ineffectual given the small proportion of retakes that end in 'success' after a year.

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<sup>9</sup> Ofsted, Mathematics: Made to measure (2012): <http://www.ofsted.gov.uk/node/19157>

<sup>10</sup> ACME, Early and Multiple Entry to GCSE Mathematics: <http://www.acme-uk.org/media/7392/early%20and%20multiple%20entry%20to%20gcse%20final.pdf>

ACME would therefore recommend that an alternative variant of the EBC should be developed to address a similar but not identical level and range of mathematics, with a very carefully designed and fresh approach to technology, applications, problem-solving and especially assessment, with a view to addressing the distinctive engagement and more mature learning needs of young people post-16. This would build on learning already achieved in KS4 (but could be freed from the requirements to test the pre-requisite for A level). The Department for Education should also consider how this alternative EBC could achieve parity of esteem with the pre-16 qualification. ACME notes here that this is not the main remit of the consultation but suggests that this new qualification could be implemented once the EBC in Mathematics has been introduced.

For those students who are functioning at significantly below this level, it is essential that other qualifications are developed with a view to encouraging progression and giving young people access to a meaningful qualification, to which they can aspire while working towards obtaining an EBC-equivalent.

### **Quality assurance**

ACME is concerned that there is no space allocated within the proposed timeline to establish any kind of piloting or trialling for this new qualification. We believe this poses serious threats to its quality and implementation. Experience tells us that even very small changes within a qualification, such as with Curriculum 2000 or the new GCSE English with controlled assessment, can have very undesirable and harmful consequences. In any case, it is reasonable to assume that any new qualification will necessitate some adjustment through its development and implementation, and the contract awarded must allow for this. For example, the GCSE Mathematics Linked Pair Pilot allowed for some incremental development to be made to ensure the qualification achieved the desired aims. If it had been implemented without any form of trialling, the consequences to young people's mathematics education could have been very damaging. To mitigate such risks, the lessons from the linked pair pilot as highlighted above, need to be acted upon. The possible consequences to young people's learning are too important to be entirely subjected to a timeline imposed by political cycles.

In addition, ACME notes that conforming to notional international standards is not sufficient; many High Performing Jurisdictions are currently in the process of altering their curricula and assessment methods to meet 21<sup>st</sup> century demands; Awarding Organisations must therefore show that they are also pro-active in this respect. This inevitably implies some degree of innovation, which ought to be trialled.

### **Franchising**

ACME welcomes the proposal to move to a single organisation for the development and provision of the KS4 qualification in mathematics, as it would avoid incentives for Awarding Organisations to compete on standards. However, we believe that the franchising model could raise some important issues and create numerous unintended consequences such as:

- The competition to be awarded the franchise could encourage Awarding Organisations to play safe, which would discourage innovation, especially in terms of curriculum development.

- The DfE's proposals are unclear about the process and criteria by which an Awarding Organisation's bid or submission would be selected. ACME recommends that the criteria should be informed by subject and assessment experts, in order to ensure that the best qualifications are chosen, rather than the ones that appear more difficult or that are produced by the largest provider.
- The proposed five years timeline for an AO to deliver the qualification presents some serious problems in terms of expertise and quality assurance. Issues such as Awarding Organisation losing their dedicated teams if they are not chosen, whether there is an expectation that the same Awarding Organisation will deliver the EBC and A levels for one given subject and the lack of comparable marking schemes don't appear to have been considered.
- The proposals as they stand would require a four years lead time, which means that the second franchise would need to be let when only one examination series had been run<sup>11</sup>.
- Any changes in the structure at GCSE will have repercussions at A level and this should be taken into account. In particular, there would be a risk that the final EBC is not coherent with the A levels offered by all other Awarding Organisations, especially in light of the proposed timeframe.
- Practically, it would create a monopoly, as the mathematics expertise at this level would be lost by the Awarding Organisations who did not get the contract. The Department for Education should consider Ofqual's<sup>12</sup> arguments on this issue.
- Without a clause in the contract to this effect, the Awarding Organisations might not be required to work with CPD providers and resources developers to share the ethos of the new qualification – this could result in a disconnected experience in the classroom.
- The franchise model could create what would effectively be a monopoly of teaching resources, as schools might be more likely to purchase textbooks issued by the chosen Awarding Organisation and written by their examiners.

ACME notes that countries which have single awarding authorities have them as state-run bodies and has explored how this could be achieved in England<sup>13</sup>. The proposal made by the DfE implies that private organisations would be effectively in charge of a subject.

ACME would recommend that more thought should be given to the whole proposal, to ensure that all possible unintended consequences are anticipated and risk assessed. A possible alternative system, which would ensure a level playing field and eradicate the race

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<sup>11</sup> See Diagram in Appendix 1

<sup>12</sup> Ofqual, Correspondence on English Baccalaureate Certificates:

<http://www.ofqual.gov.uk/news/correspondence-on-english-baccalaureate-certificates/>

<sup>13</sup> ACME, Thought piece on a National Subject Committee: <http://www.acme-uk.org/news/news-items-repository/2012/6/acme-thought-piece-on-a-national-subject-committee>

to the bottom, could be to set up a modest size collaborative body to develop EBC examinations in mathematics. This could ensure that a breadth of the best available expertise is utilised and maintained. Awarding Organisations would be able to compete on the service they offer to schools and colleges, such as regional distribution of the examinations and coordination of the marking of the papers to commonly agreed standards.

### **Calculators**

ACME believes that removing calculators altogether from the assessment process would significantly reduce the range of mathematics that can be assessed in a meaningful way. Calculators and other ICT devices can be very powerful tools, for example in modelling realistic situations, although they should not be used as a substitute for insufficient knowledge and fluency. ACME would suggest that the new qualification's assessment should include some parts where calculators are not allowed, for example when testing fluency. In those parts of the curriculum where calculators are allowed, there should be an expectation that their appropriate use will be assessed, even if novel ways have to be developed to do so.

## Appendix A

### Tendering process for awarding bodies under the franchising model

<b>Tender</b>	<b>Award Contract Development</b>	<b>Development Info into schools</b>	<b>First teaching</b>	<b>1<sup>st</sup> Examination</b>	<b>2<sup>nd</sup> Examination</b>	<b>3<sup>rd</sup> Examination</b>	<b>4<sup>th</sup> Examination</b>	<b>5<sup>th</sup> Examination</b>		
<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	
					<b>Tender?</b>	<b>Development Contract?</b>	<b>Info into Schools Development</b>	<b>First Teaching</b>	<b>1<sup>st</sup> Examination</b>	