Joint Mathematical Council of the United Kingdom

Minutes of the meeting held at the Royal Statistical Society on Tuesday 23 February 2016

Present

Officers

Chair	Paul Glaister
Honorary Secretary	Peter Thomas
Honorary Treasurer	Paul Harris

Representatives of Participating Societies

Adults Learning Mathematics	Jeff Evans
Association of Mathematics Education Teachers	Ros Hyde
Association of Teachers of Mathematics	Sue Pope
British Society for Research into Learning Mathematics	Hilary Povey
British Society for the History of Mathematics	June Barrow-Green
Conference of Heads of Departments of Mathematical Sciences	Jan van den Heuvel (deputy)
Edinburgh Mathematical Society	David Pritchard
Institute of Mathematics and its Applications	Chris Chipperton
London Mathematical Society	Alice Rogers
The Mathematical Association	Peter Ransom
Mathematics in Education and Industry	David Holland (deputy)
National Association for Numeracy and Mathematics in Colleges	Sally Barton
National Association of Mathematics Advisors	Lynn Churchman (deputy)
National Numeracy	–
National STEM Learning Centre	–
NRICH representing the Millennium Mathematics Project	Ems Lord
Operational Research Society	–
Royal Academy of Engineering	–
Royal Statistical Society	Olivia Varley-Winter (deputy)
United Kingdom Mathematics Trust	Bill Richardson
Wales Institute of Mathematical and Computational Sciences	–

Co-opted Members

Chair of the BCME Committee	David Martin
Immediate Past Chair	Tim Rowland
UK Representative to International Commission on Mathematical Instruction	–

Representatives of Observing Societies

Advisory Committee on Mathematics Education	Robert Barbour
Department for Education [England]	–
Department of Education [Northern Ireland]	–
Education Scotland	Lorna Harvey
Higher Education Academy	Sean Ryan
National Centre for Excellence in the Teaching of Mathematics	–
National College for Teaching and Leadership	–
Office for Standards in Education	–
The Office of Qualifications and Examinations Regulation	–
The Royal Society	David Montagu

Visitors

Advisory Committee on Mathematics Education Secretariat	–
Department for Education and Skills [Wales]	–
for the afternoon discussion (item 13)	Debbie Barker
for the afternoon discussion (item 13)	Lynn Churchman

1 Introduction

1.1 **Welcome** The Chair welcomed everyone to the meeting.

1.2 **Practical Arrangements** The Honorary Secretary read out the procedure for emergency evacuation as laid down in the contract for the booking of the premises.

1.3 **Apologies for absence** Apologies for absence were received from Matt Bulmer (NCTL), Mike Ellicock (National Numeracy), Julie Harris (DE), Catherine Hobbs (HoDoMS), Janet Holloway (Ofqual), Jane Imrie (NCETM), Jane Jones (Ofsted), Matt Lewis (NAMA), Sofya Lyakhova (WIMCS), Stephen Lyon

(National STEM Learning Centre), Niamh Mc Mahon (ACME Secretariat), Neil Sheldon (RSS), Charlie Stripp (MEI) and Charlene Timewell (ORS).

2 Minutes of the meeting held on Tuesday 10 November 2015

2.1 **Approval** The minutes of the meeting held on Tuesday 10 November 2015 were approved.

2.2 **Matters arising not elsewhere on the agenda** None.

3 Reports from JMC Executive Committee

3.1 **Chair** The Chair reported that he had attended the launch of the ACME report on initial teacher education on 11 November 2015, an ACME round table, involving Ofqual, on the reform of A and AS Mathematics and Further Mathematics on 11 December 2015 and an informal meeting with Philip England (Chair of ACME) and Niamh Mc Mahon (Head of ACME Secretariat). The Chair said he would attempt to find out about progress with the open call for new ACME members.

The Chair said that he had met with Sir Adrian Smith and Lindsay Walsh of the Council for the Mathematical Sciences to discuss progress on forthcoming initiatives. The Chair had represented the JMC at the launch of the CMS report, *Mathematical Sciences: Driving the UK Economy*, on 26 January 2016.

The Chair said that a meeting had been set up for April 2016 with NCTL to discuss teacher recruitment and retention through its representative Matt Bulmer. An invitation has been extended by NCTL to JMC societies to contribute to NCTL's CPD guide.

The Chair then invited questions. Tim Rowland asked whether the conversation with Adrian Smith had included the National Mathematics Subject Committee. The Chair responded that it had and he explained that The Royal Society had approached CMS to set up the NMSC, CMS had engaged with the Institute of Physics and the Royal Society of Chemistry to learn about how they had gone about setting up parallel bodies in physics and chemistry, but there had been no further progress; he also said that he had been assured by Adrian Smith that, when there was progress, the JMC would be involved.

3.2 **Honorary Secretary** In addition to his written report said that the Council meeting in February 2017 would be on 28 February. He also gave some information about meetings at which the JMC would be represented.

- On 23 and 24 February 2016, Tony Cotton is representing JMC at the National Maths Hubs Forum.
- On 18 March 2016, Sue Pope would represent JMC at an ACME round table on the professional learning journey.
- On 18 April 2016, Ros Hyde, as well as our permanent representative Alison Clark-Wilson, will attend the Annual General Meeting of the Council for Subject Associations.
- On 15 April 2016, The Chair, Helen Farmery (AMET primary), Ros Hyde (AMET secondary), Sue Pope (ATM), Peter Ransom (MA) and Nigel Steele (IMA) would attend a meeting with NCTL to discuss community concerns regarding initial teacher education.
- The Chair and Ros Hyde will represent JMC at a meeting (on a date to be agreed) with ACME to discuss follow up to ACME's report on initial teacher education.

3.3 **Honorary Treasurer** The Honorary Treasurer said that income for the year stood at just under £9000 and expenditure at just under £4000. He said that at the time of writing his report five societies had not paid their subscriptions but two have now paid; he will be sending reminders to the remaining three societies. He was pleased to add that the banking problems relating to the BCME accounts have now been resolved.

4 Announcement of an Election for Honorary Secretary

The Honorary Treasurer, acting as returning officer, invited nominations for the position of Honorary Secretary to serve for three years from the end of this year's Annual General Meeting. He said that nominations should be made by 30 April 2016 and if a vote was needed then it would take place at the meeting of the Council on 14 June 2016.

5 Informing the Council of Executive Committee business

The Chair introduced the proposal, which sought to address a call for greater openness in the way the Executive Committee conducts its business, and invited comment. Bill Richardson said that he felt it represented a good start. The motion, proposed by the Honorary Secretary and seconded by Sue Pope, was then put to a vote. It was thereby resolved, with 15 votes in favour, none against and no abstentions, that

1. The Honorary Secretary shall circulate to the Council a summary of the agenda for each meeting of the Executive Committee.
    a. When an Executive Committee meeting takes place immediately preceding a Council meeting then the summary of the agenda for the Executive Committee meeting shall form an appendix to the agenda for the Council meeting.
    b. The Chair shall have absolute discretion to exclude from the summary of the agenda for an Executive Committee meeting any matter the inclusion of which he or she judges detrimental to the furtherance of the objects of the JMC.
2. The Honorary Secretary shall circulate to the Council a summary of the minutes of each meeting of the Executive Committee.
    a. When an Executive Committee meeting takes place immediately preceding a Council meeting then the summary of the minutes of the Executive Committee meeting shall form an appendix to the minutes of the Council meeting.
    b. The Chair shall have absolute discretion to exclude from the summary of the minutes of an Executive Committee meeting any matter the inclusion of which he or she judges detrimental to the furtherance of the objects of the JMC.
3. The practices introduced in 1 and 2 above shall be reviewed at the first Council meeting held in 2017.

6 JMC activities involving Children and Vulnerable Adults

The Chair introduced the proposal, which sought to ensure that the Council did not inadvertently fail to fulfil safeguarding requirements, and invited comment. The motion, proposed by Lynn Churchman and seconded by Sally Barton, was then put to a vote. It was thereby resolved, with 16 votes in favour, none against and no abstentions, that

1. The JMC shall not work directly with children unless the Council has specifically authorised that work and all checks required by law have been carried out.
2. The JMC shall not work directly with vulnerable adults unless the Council has specifically authorised that work and all checks required by law have been carried out.

7 Draft Constitution for the Charitable Incorporated Organisation

The Chair thanked the Honorary Secretary for his work on the conversion of the JMC into a CIO.

The Honorary Secretary then took the Council through consideration of the draft constitution, section by section. He pointed out that, under the present JMC Constitution, when a draft is put to the Special General Meeting for adoption on 14 June 2016 there will no opportunity to amend it, so it was important to get the draft right now, or as soon as possible after the present meeting. The following points were raised (there were also some other points of clarification).

4.9	Jeff Evans asked whether it was necessary for the JMC to have the powers given in 4.9. Alice Rogers responded that the purpose of 4.9 was to place a responsibility on the trustees to take advice when making investments.
9.1.1.1	The meaning of ‘time to time’ in 9.1.1 was queried.
9.5	David Pritchard asked whether in 9.5 ‘his or her’ should be ‘his or her or its’.
12.3.1.1.2	The Chair said that there may be circumstances in which it would be useful to have a Deputy Chair and it was useful to make provision for one. Tim Rowland asked why any Deputy Chair would be elected by the Council rather than by and from the other trustees. The Chair replied that it was useful to have an extra person and election by the Council was more transparent. Sally Barton said that 12.3.1.1.2 was permissive and that if someone was elected as Deputy Chair then it was important he or she had the confidence of Council.
12.6	The Chair explained that the move from a one-year to a three-year term for Elected Trustees was to make it more attractive to serve as a trustee and to make it easier for trustees to lead in particular areas of the trustees’ work.
12.6.7	The parenthesis ‘(or Observing Bodies)’ should be deleted in 12.6.7.
13.1	The word ‘Rules’ should be replaced by ‘Bye Laws’ in 13.1.
28	It was felt that there was a lack of clarity (and perhaps consistency) as to what was meant by the word ‘member’ and that it might be advantageous for a definition to be included.

It was agreed that members would have until 1 March 2016 to submit further comments, then the Honorary Secretary would ask our solicitors, Hewitsons LLP, to prepare a draft to put to the Special General Meeting.

[**Post-meeting note:** Hewitsons LLP has prepared a new draft in the light of the comments made and responded to our queries.

9.1.1.1 'The Officers from time to time' means the current Officers at the relevant time.

9.5 The phrase 'his or her' has been replaced by 'his or her or its' which should remove the uncertainty as to the meaning of the word 'member'. The duty to act in good faith for the furtherance of the purposes of the Council would fall to the Member itself, though clearly an institution must ensure its representative complies with the duty, as it can only act through this person.]

8 ICME

The Chair said that progress with the ICME Bursaries had been discussed at JMC Executive Committee meeting earlier that day. Hilary Povey said that she had received an email from Chris Budd, Chair of the ICME Bursaries Committee, saying that thirteen applications had been received for eight bursaries; she also said that the members of the ICME Bursaries Committee had yet to receive copies of the applications from Chris Budd. The Chair said he would contact Chris Budd to urge him to send the applications round the committee. Sue Pope added that ICME was not long off and the applicants need to know where they stood. Jeff Evans asked whether the bursaries fund had to be awarded as eight bursaries or whether it could be redistributed among more recipients. Hilary Povey said that such a redistribution was an alternative strategy and it would be borne in mind.

[**Post-meeting note:** Chris Budd circulated the twelve applications to the Bursaries Committee on 26 February 2016. It was decided to award twelve bursaries of £400.]

9 BCME

David Martin, Chair of the BCME Committee, spoke about his written report and invited questions and comments. He said the BCME Committee would next meet on 9 March 2016 and it would be considering the venue (which he said was likely to be The University of Warwick), the theme and possible sponsors. Sue Pope asked whether there should be a theme or not. The Chair said that there would be better participation without a theme. Lynn Churchman noted that some past BCMEs have had a theme and some not; Sue Pope added that whilst the last three BCMEs have had themes, earlier ones had not. Sue Pope also said that MMSA thought a theme unnecessary. David Martin said that an alternative would be to have a strapline. Ros Hyde said that BCME was sufficiently infrequent not to need a theme. Sean Ryan added that there was a danger in setting a theme so long in advance. Hilary Povey said that a strapline helps people know what BCME is and what it stands for.

10 Reports from Participating Societies

10.1 **Association of Mathematics Education Teachers** Ros Hyde brought three recent developments to the Council's attention.

- NCTL has started the Subject Knowledge Enhancement Early Entry Pilot Programme which allowed potential teachers to undertake an SKE course without holding an ITT place and so make them more able to obtain an ITT place. About a dozen institutions were involved in the programme.
- There have been changes to details of the funding arrangements for ITT.
- A report on School Direct has been published by Manchester Metropolitan University (https://www2.mmu.ac.uk/media/mmuacuk/content/documents/pdei/projects/School-Direct-Research-Report.pdf).

Discussion followed in which attention was drawn to a BBC report (http://www.bbc.co.uk/news/education-35631030) that Stoke-on-Trent is offering to pay-off the tuition fees of mathematics teachers (as part of a million-pound project with funding from bet365) and to a National Audit Office report (https://www.nao.org.uk/report/training-new-teachers/) which said that recruitment is not the only issue for teacher supply: retention is also an issue.

10.2 **Institute of Mathematics and its Applications** Chris Chipperton said that the first round of the amended Mathematics Teacher Training Scholarships was in progress. In response to questions at a previous Council meeting, he said that information about the educational background of applicants was not collected as part of the application process and the destination schools were not known but an attempt was being made to gather that information voluntarily from the scholars. He pointed out that there are six case studies of MTTS scholars working in the state sector and one of a scholar working in the independent sector on the MTTS pages on the IMA website.

Chris Chipperton also noted that the IMA's Schools and FE Committee has in recent months responded to three Ofqual consultations and is now working on a response to a fourth Ofqual consultation.

10.3 **The Mathematical Association** Peter Ransom said that, since writing his report, the MA had learnt of the death of Sir Christopher Zeeman; an obituary by Ian Stewart will be published in the July 2016 issue of The Mathematical Gazette. David Montagu added that Sir Christopher was a Fellow of The Royal Society and in due course a biographical memoir would be published. Those present were also reminded of Sir Christopher's contribution to the JMC's report on the teaching of geometry. June Barrow-Green drew attention to the Sir Christopher Zeeman Archive on the LMS website (https://www.lms.ac.uk/2015/zeeman_archive/listing).

10.4 **Mathematics in Education and Industry** David Holland invited questions on the MEI report; none were asked.

10.5 **National Association of Mathematics Advisers** Lynn Churchman said she had nothing to add to the NAMA report but she invited all societies to make use of the paper *Five Myths of Mastery in Mathematics* which tried to address the confusion in schools over mastery teaching in mathematics; the paper had received positive comments on social media; it was hoped it could be used as a stimulus for discussion. Sue Pope welcomed the paper and asked if it could be put on an open area of the NAMA website; Lynn Churchman said she would check if this was the case. Lorna Harvey asked if it could be shared in Scotland; Lynn Churchman responded that it could.

[**Post-meeting note:** The paper *Five Myths of Mastery in Mathematics* can be found at http://www.nama.org.uk/Downloads/Five%20Myths%20about%20Mathematics%20Mastery.pdf.]

10.6 **National STEM Learning Centre** The report was noted.

10.7 **National Numeracy** The report was noted.

11 Reports from Observing Societies

11.1 **Advisory Committee on Mathematics Education** Robert Barbour said, in supplement to the written report that Phoebe Harris had left the ACME Secretariat a few weeks previously to become Public Affairs Officer at Battersea Dogs & Cats Home and a temporary replacement is working in the ACME Secretariat. He also expressed concern at the decline in the number of members of ACME: two and half years ago there were eight members and three in the secretariat, now there were only five members and one in the secretariat; this raised capacity issues.

Robert Barbour said that ACME's ITE report was now in its implementation phase. He noted that Neil Carmichael, Chair of the Education Select Committee of the House of Commons, has read the report and said he thought it good.

Robert Barbour thanked the Council for the discussion on teachers' professional learning journey at the Council meeting on 10 November 2016, the contributions have been taken on board; in particular, any model for the journey should not be linear and it should not be a set of hoops to go through. ACME in its work on this topic was looking to ensure compatibility with the requirements for Chartered Mathematics Teacher status and the College of Teaching. He said that Deborah Ball's work on Domains of Mathematical Knowledge for Teaching had been found particularly valuable.

Robert Barbour said that ACME's report on problem-solving would be published very soon; it will cover from Key Stage 2 to A Level; it will say that problem-solving can be a key part of assessment.

Robert Barbour continued that there was a great deal of uncertainty around. ACME was trying to maintain a dialogue with Ofqual about A Level, ensure the development of Core Maths in a sustainable way, and use its convening ability to encourage engagement between the mathematics education community and the early years community. He said that there were also serious concerns about assessment at the end of Key Stage 2 and GCSE. Summarising the situation, he said that there was no stability anywhere.

Robert Barbour concluded on a positive note by giving news of ACME's Annual Conference which would be held on 12 July 2016 on a theme related to teacher recruitment and retention.

The Chair reflected on the pressing nature of the issues of teacher recruitment and retention. He also asked Robert Barbour about when the open call for new members of ACME would take place. Robert Barbour replied that he did not know and referred the Chair to The Royal Society, he went on to point out that three of the five remaining members of ACME would leave ACME this year.

Sue Pope asked if ACME was minded to do anything about the situation at Key Stage 2, including the new 'times tables' test and the information for teachers doing Year 6 Key Stage 2 assessments which she said is riddled with errors. Robert Barbour said that the Standards and Testing Agency's

guidelines were not compatible with the National Curriculum; ACME was having trouble engaging the STA in dialogue but there was some interest from Ofqual as GCSE may be affected if there is not a proper curriculum or assessment at Key Stage 2. Sue Pope said that Helen Claydon from the STA had attended a recent MMSA meeting and there had been a useful discussion; the subject of the teachers' assessment material was raised with her but she was from a different arm of STA. Lynn Churchman observed that there is no funding to support teacher assessment: the Government is not putting any money in as it is not interested in teacher assessment.

David Martin said that he was pleased to see that retention was being emphasised as well as recruitment. The Chair and others agreed. Lynn Churchman said that the average working life of a secondary mathematics teachers is under five years. Ros Hyde said there was also the issue of the sheer number of mathematics teachers needed. David Martin asked if there should be more emphasis on returners. Sue Pope said there is a NCTL initiative on returners, which is being delivered through schools.

11.2 **National Centre for Excellence in the Teaching of Mathematics** The report was noted.

11.3 **National College for Teaching and Leadership** The report was noted.

12 Reports from meetings

None.

13 Discussion: GCSE

Sue Pope opened the session and introduced Debbie Barker and Lynn Churchman; Sue Pope said that the discussion was looking at what the JMC GCSE Working Group might do. She then spoke about the new GCSE in Mathematics with the aid of a series of slides (summarised in the boxes below). The new GCSE is to examine the mathematics programme of study in the 2014 National Curriculum.

2014 NC Purpose of study

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

2014 NC The aims

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can **solve problems** by applying their mathematics to a variety of routine and non- routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Working at the pace of learners

- decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content.
- Within each key stage, schools have the flexibility to introduce content earlier or later than set out in the programme of study.

However the attainment target is the full Programme of Study by the end of the KS.

Statements on working mathematically exist for secondary but not for primary.

Working Mathematically – develop fluency

- consolidate their numerical and mathematical capability from KS3 and extend their understanding of the number system to include powers, roots {**and fractional indices**}

- select and use appropriate calculation strategies to solve increasingly complex problems, including exact calculations involving multiples of π {**and surds**}, use of standard form and application and interpretation of limits of accuracy
- consolidate their algebraic capability from KS3 and extend their understanding of algebraic simplification and manipulation to include quadratic expressions, {**and expressions involving surds and algebraic fractions**}
- extend fluency with expressions and equations from KS3, to include quadratic equations, simultaneous equations and inequalities
- move freely between different numerical, algebraic, graphical and diagrammatic representations, including of linear, quadratic, reciprocal, {**exponential and trigonometric**} functions
- use mathematical language and properties precisely.

Working Mathematically – reason mathematically

- extend and formalise their knowledge of ratio and proportion, including trigonometric ratios, in working with measures and geometry, and in working with proportional relations algebraically and graphically
- extend their ability to identify variables and express relations between variables algebraically and graphically
- make and test conjectures about the generalisations that underlie patterns and relationships; look for proofs or counter-examples; begin to use algebra to support and construct arguments {**and proofs**}
- reason deductively in geometry, number and algebra, including using geometrical constructions
- interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning
- explore what can and cannot be inferred in statistical and probabilistic settings, and express their arguments formally
- assess the validity of an argument and the accuracy of a given way of presenting information.

Working Mathematically – solve problems

- develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems
- develop their use of formal mathematical knowledge to interpret and solve problems, including in financial contexts
- make and use connections between different parts of mathematics to solve problems
- model situations mathematically and express the results using a range of formal mathematical representations, reflecting on how their solutions may have been affected by any modelling assumptions
- select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems; interpret their solution in the context of the given problem.

In Key Stage 3 there is more content than before but less statistics.

Changes for all in KS3

- Standard form and indices
- Finding the original amount e.g. If the sale price is £24 and the discount is 25%, how much do I save?
- Speed, density and unit pricing
- Trigonometry
- Less emphasis on statistics – handling data cycle removed
- Venn diagrams for probability

There is also additional content for GCSE. This will have a big impact at 16, but also post-16.

GCSE additional content	
Foundation (much of this was once Intermediate)	**Higher**
• Venn diagrams • Trigonometry - exact values for cosine, sine and tangent of 0°, 30°, 45° , 60° and 90° • Surds • Quadratics • Reciprocal and cubic graphs • Arithmetic and geometric progressions • Inequalities • Simultaneous equations • Compound units (e.g. density, pressure) • Direct and inverse proportion • Growth and decay, compound interest • Congruence conditions for triangles • Fractional scale factor • Surface area and volume of spheres, pyramids, cones and composite solids • Calculate arc lengths, angles and areas of sectors of circles • Vectors • Calculate the probability of independent and dependent combined events, including using tree diagrams and other representations • Sampling	• Venn diagrams • Inverse and composite functions • Exponential and trigonometric functions • Estimate gradients and areas under graphs in speed, distance, time contexts • Equation of a circle and tangent at a point • Prove standard circle theorems • Use vectors to construct arguments and geometric proofs

There are also more formulae which learners are expected to know.

Students are expected to know Formulae/methods

- Quadratic formula
- Circumference of a circle
- Area enclosed by a circle
- Pythagoras' theorem
- Trigonometric formulae
- Area of a trapezium
- Volume of a prism
- Compound interest
- Probability

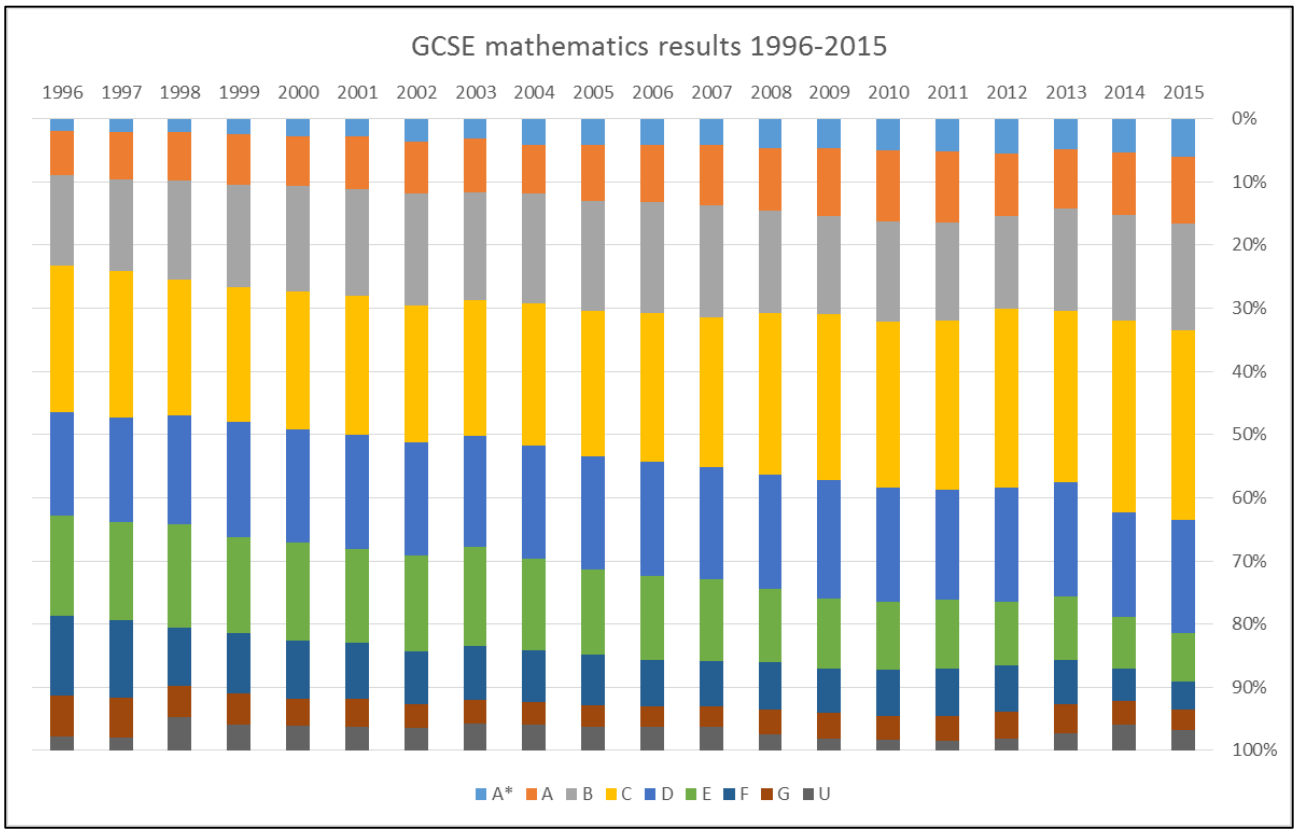
GCSE 2015 Assessment Objectives and Weightings

	Assessment Objective	F	H
1	**Use and apply standard techniques** • accurately recall facts, terminology and definitions • use and interpret notation correctly • accurately carry out routine procedures or set tasks requiring multi-step solutions	50	40
2	**Reason, interpret and communicate mathematically** • make deductions, inferences and draw conclusions from mathematical information • construct chains of reasoning to achieve a given result • interpret and communicate information accurately • present arguments and proofs	25	30

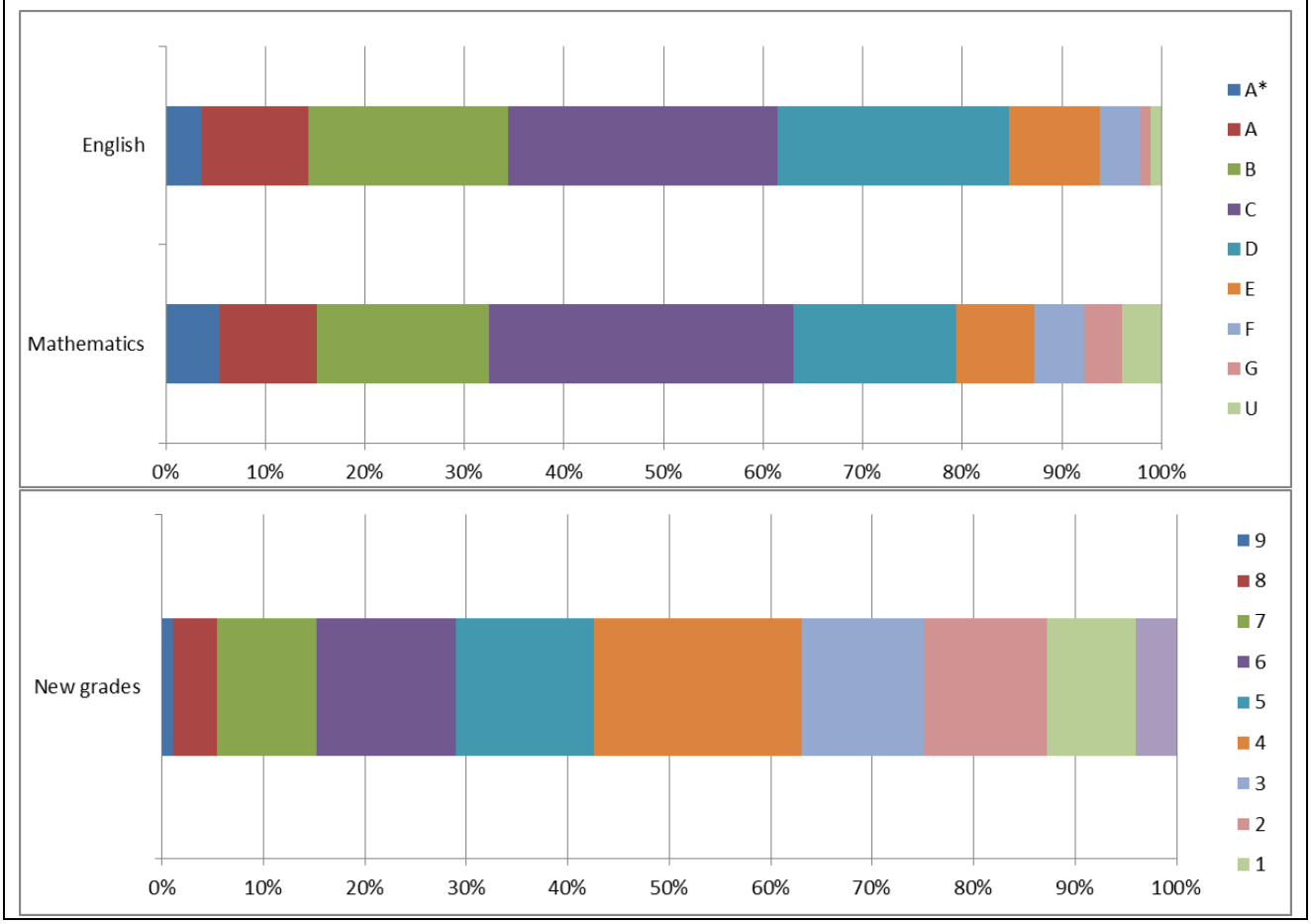
	• assess the validity of an argument and critically evaluate a given way of presenting information		
3	**Solve problems within mathematics and in other contexts** • translate problems in mathematical or non-mathematical contexts into a process or a series of mathematical processes • make and use connections between different parts of mathematics • interpret results in the context of the given problem • evaluate methods used and results obtained • evaluate solutions to identify how they may have been affected by assumptions made	**25**	**30**

GCSE mathematics 2015

- Single GCSE for candidates
- Double counted in school performance tables
- Government recommends one hour more teaching each week in KS4
- Two tiers: Grades 1 to 5 and Grades 4 to 9
- New grading system (grades 1 to 9)
- Grade 4 matches with current GCSE grade C
- Grade 7 matches with current GCSE grade A
- Grade 9 is the top 20% of current GCSE grade A*****



Modelling future GCSE grading with GCSE 2014 results



The above modelling assumes the current top of C and B is distributed equally across new grades 5 and 6 and current D and E are equally distributed across grades 2 and 3; 20% of the cohort is likely to get grade 4 but not grade 5. Grade 5 will be used in performance measures.

Debbie Barker then spoke of her experience on the ground for MEI, much of her work is with non-specialist teachers.

- Schools have been seeking help with the problem-solving demands of the new GCSE.
- The increased demand is welcomed, but there are differences of opinion on the content, there are opportunities for increased investment in professional development.
- The argument for increased teaching time still needs to be won with senior management teams.
- Quite what is happening with grades 4 and 5 is causing confusion; there is a need for timely and accurate information.
- The raising of a good pass from 4 to 5 will be a disaster for post-16 participation.

There then followed an impromptu discussion.

The Chair said that he expected those higher education institutions which currently ask for a grade B at GCSE will more likely ask for a grade 5 if they are worried about the new results but recruiter institutions will more likely ask for a grade 4.

Chris Chipperton said that employers will take their cue from the league tables and will want a grade 5.

Alice Rogers asked whether a grade 4 would give entry to courses leading to Core Maths qualifications and whether a Core Maths qualification could act as a proxy for a good pass at GCSE.

Debbie Barker said that we needed to encourage grade 4 being seen as the requirement for access to Level 3 courses.

Robert Barbour said we should push for post-16 provision not to be about resitting GCSE but about Level 3 Core Maths and 'Level 2 Core Maths'.

David Holland said that Charlie Stripp hoped that anyone getting a grade 4 could do Core Maths and then progress from that.

Lynn Churchman said it depends on what a grade 4 means. What will a student need to be able to do to get a grade 4? She had heard of colleges saying they will ask for a grade 7 instead of a grade B for entry to A Level, as it is the grade which is two down from the top.

Sally Barton asked whether we can argue that Core Maths could be a proxy for a GCSE grade 5.

The Chair said that he had found that universities were asking about grade equivalence between Core Maths and GCSE.

Lynn Churchman then spoke, she said that she was working with about eighty providers. Apart from the demands of the new GCSE, the requirement for all 16–19 year olds in further education to have or be working towards GCSE Mathematics was making major logistic demands. She then went on to describe her concerns.

- The situation around equity and access is a disgrace.
- Schools in categories often have many non-specialist mathematics teachers.
- There is an increase in content and process, especially for the foundation tier.
- The content is 1.7 GCSEs and the students only get one GCSE but schools get two.
- There is a ramping up of demand in papers and some of the extra content is behind the higher demand.
- This is a huge national experiment without data behind it.
- We will not know what Grade 4 means until it has happened.
- There are concerns about progression.
- There are no grade criteria – the boards say they don't know about them.
- There is an increased time demand, but what is actually provided varies between schools, four hours a week is needed from Year 7. There are equity and access issues here, it is a lottery at present.
- We can see it is going to crash.

Those present were then asked to discuss the following issues in groups of three.

Issues to consider

- 'Big fat' GCSE worth one GCSE for students and two for school
- Increased expectations at Foundation tier
- PD needs of teachers especially around new topics, linear only assessment and problem solving
- Leap in expectations for Y9 and Y10 students who have not had access to the 2014 curriculum from Y7
- Teaching time for the new GCSE – subject leaders have to make the case to school leaders and are there sufficient teachers
- Implications of the change to grades to attainment, participation, progression

What should/can JMC do?

After the group discussion there was a plenary for feedback in which the following points were made.

Feedback and what JMC should do

- Border grades – what can students do at different grades
- What the exams and accountability look like
- Process matters
- Use problem solving to develop Y7 curriculum and bring children up to 'same level'
- Hiatus in primary curriculum too
- Numeracy across the curriculum is expected in Wales and Scotland
- Whole school issue to get good results in mathematics and English
- Clear guidance at least four hours teaching time each week from the beginning of secondary with emphasis on problem solving and reasoning not just content
- Survey schools about how much time is being given to mathematics including BTECs and numeracy across the curriculum
- What might the success criteria of this change be?
- Find out what is happening in other subjects e.g. English, senior managers

• A level project CMEP – four year development of resources – what about GCSE? • PD for teachers • Role of awarding organisations	• Raise awareness of PD needs and opportunities from JMC member organisations • Contact teaching schools about SLEs and how they might be coordinated • Explore possibility of subject association conferences like the ones done for primary • Liaise with AOs, Ofqual and other concerned organisation – risk management

The Chair then thanked Debbie Barker, Lynn Churchman and Sue Pope for leading the discussion.

14 Any other business not elsewhere on the agenda

None.

15 Conclusion

The Chair thanked everyone present for their contributions and closed the meeting.

16 Dates of future meetings

Tuesday 14 June 2016
Tuesday 8 November 2016
Tuesday 28 February 2017

These meetings will be held at the Royal Statistical Society and begin at 1100.

Summary Minutes of the Executive Committee meeting held at the Royal Statistical Society on Tuesday 23 February 2016

Present Paul Glaister (Chair), Peter Thomas (Honorary Secretary), Paul Harris (Honorary Treasurer), Sally Barton, Ros Hyde, Sue Pope and Hilary Povey.

1 Previous Business

1.1 **Previous Meeting**

The minutes of the previous meeting were approved.

1.2 **Decisions since the previous meeting**

1.2.1 **Nomination of a Representative to the National Maths Hubs Forum**
(confirmed by the Chair 26 November 2015)

- Tony Cotton shall be invited to serve as JMC Representative to the National Maths Hub Forum until 31 December 2018.
- On 27 November 2015, Tony Cotton accepted our invitation.

1.2.2 **Nomination of a Representative to the Numeracy Forum**
(confirmed by the Chair 26 November 2015)

- Sally Barton shall be invited to serve as JMC Representative to the Numeracy Forum until 31 December 2018.
- On 21 December 2015, Sally Barton accepted our invitation.

1.2.3 **Timing of JMC Meetings in November 2016**
(confirmed by the Chair 29 November 2015)

- On 8 November 2016:
  - the Executive Committee shall meet at 9 a.m.;
  - if the CIO has been established: the final AGM of the unincorporated society shall take place at 11 a.m. and be followed by the first AGM of the CIO;
  - if the CIO has not been established: the AGM shall take place at 11 a.m. and be followed by a meeting of the Council.

1.2.4 **Returning Officer for the Election of the Honorary Secretary**
(confirmed by the Chair 29 November 2015)

- The Honorary Treasurer shall act as Returning Officer for the election of the Honorary Secretary to be held in 2016.

1.3 **Actions**

The action points from the previous meeting were reviewed.

1.4 **Matters arising not elsewhere on the agenda**

None.

2 International Affairs and the ICME Bursaries

It was reported that funding was available for 8 bursaries at £600 each (funded by the IMA and the LMS) and that 12 applications had been received but the members of the Bursaries Committee had yet to receive them. Given how soon ICME was, it was agreed that it was important that applicants knew as soon as possible whether they would be funded or not. [**Post-meeting note:** Chris Budd circulated the applications to the Bursaries Committee on 26 February 2016. Twelve bursaries of £400 have been awarded.]

3 ACME and the National Mathematics Subject Committee

The present situation with ACME (regarding its future governance and the pending open call for new members) was reported and discussed. There was also a brief discussion of the present situation regarding the establishment of the NMSC.

4 BCME

The Executive Committee expressed its gratitude for the work of the Chair and members of the BCME Committee.

5 Charitable Incorporated Organisation

There was a brief discussion of the draft constitution in preparation for its consideration at the following Council meeting.

6 GCSE Working Group

It was agreed that a GCSE Working Group be established; the group would last for two years to observe and report on the first cohort taking the new GCSE in England. It was also agreed that the afternoon's discussion would set the agenda for the group and it would be good to have an initial position statement available before the Easter conferences, the statement would be designed to stimulate debate; it would be signed off by the JMC Executive Committee. It was further agreed that Sue Pope, as a member of the Executive Committee (and trustee) would be responsible for liaison with the group; she would also convene the group. The group would be a mix of JMC representatives and wider expertise; there would be a small core to be agreed by the Executive Committee but also an outer group of interested people. A report or update would be provided by the group for each meeting of the Executive Committee. [**Post-meeting note:** Debbie Barker, Lynn Churchman, Ian Jones and Andy Noyes have agreed to join the working group. A draft position statement has been circulated to Participating Societies and Observing Societies with a request for feedback.]

7 Future Business

7.1 **Dates of future meetings**

It was noted that meetings of the Executive Committee and the Council are to be held on Tuesday 14 June 2016 and Tuesday 8 November 2016. It was agreed that the spring term meeting in 2017 should be held on 28 February 2017.

7.2 **Future presentations and discussions at Council meetings**

It was agreed that the theme for the discussion item at the Council meeting on 14 June 2016 would be 5 – 16 statistics education in the United Kingdom.

It was agreed that, as usual, ACME would lead the discussion at the November Council meeting on 8 November 2016.

It was agreed that it was premature to fix the discussion topic for the meeting on 28 February 2017.

8 Any other business

The Honorary Secretary reported that members of CfSA had been invited to send two representatives to the CfSA AGM on 18 April 2016; the agenda for the meeting would include discussion of teacher supply, non-GCSE qualifications, careers support for subject teachers and the College of Teaching. It was agreed that Ros Hyde would attend as well as our permanent representative, Alison Clark-Wilson.

It was agreed that the Chair and Ros Hyde would represent JMC at a meeting (on a date to be agreed) with ACME to discuss follow up to ACME's report on initial teacher education. It was also agreed that Sue Pope would represent JMC at an ACME round table on the professional learning journey on 18 March 2016.

It was also noted that the Chair, Helen Farmery (AMET primary), Ros Hyde (AMET secondary), Sue Pope (ATM), Peter Ransom (MA) and Nigel Steele (IMA) would attend a meeting with NCTL on 15 April 2016 to discuss community concerns regarding initial teacher education.