



ANNUAL REPORT 2016-2017

MATHEMATICAL ASSOCIATION



supporting mathematics in education

President's Report

It has been my very great pleasure, and privilege, to be President of The Mathematical Association over the last year. Highlights have been visits around the UK to talk about mathematics and mathematics education to a very wider range of groups, from university mathematicians to Probus groups, from early years teachers to engineers, 9 year olds to largely 80+ year olds - and of course to some of our own branches. The request has usually been to provide 'mathematical inspiration', so no pressure there! Preparation for such occasions has been an excuse to revisit mathematical puzzles and problems, and issues in mathematics education, from a variety of points of view, and at a variety of levels, so great fun – and also an awesome responsibility, in a society still far too often suspicious of enjoyment of this wonderful discipline.

And that's what it is: from pre-school mathematics to cutting-edge mathematical knowledge, the discipline is fundamentally the authority in our cultural endeavour to understand and harness the world from a mathematical viewpoint, and to pursue understanding of the patterns, relationships and potential inherent in that mathematisation. It is my belief that we should not shy away from our reference points, in language and epistemology, within the discipline: to do so, even at a pre-school level, is to short-change future generations. I remember some years ago a conversation with a 3 year old who was just learning to jump backwards – for her, a physically-challenging pattern-making. She pronounced that 3 jumps forward and 2 backward was 'the same, but different' from one jump forward – *if (and only if)* you could jump as far backwards as you could forwards. She then started talking in terms of 'backward numbers', and how if you faced the opposite direction you could do all sorts of interesting things with 'backwards' and 'forwards' numbers. We naturally mathematise the word around us – and with skill and deep knowledge of elementary mathematical concepts, teachers can capture that and fan the flames – what an opportunity and what a privilege.

For me personally, my Presidential year came towards the end of a working life spent with mathematics, with teachers and with young people. I was lucky enough to experience challenging and confident teaching at my grammar school, and was taken as a sixth former to a meeting of the London branch of The Mathematical Association. Having worked out that by reading mathematics I could maintain my twin love affairs with both mathematics and music, I attended my first MA conference in 1975, and from that began to develop a deep-seated belief that *all* young people can enjoy the



challenge and the satisfaction of successful working with mathematics at an appropriate level. My first job, in a boys' grammar school, was interpreted as being precisely that: to engage my students so they enjoyed mathematics and, aged sixteen, preferably had a certificate to show for it. My colleagues were happy to offer ideas, but, steeped as I was in mathematics and confident in the respect accorded most teachers at that time, I was encouraged to experiment and to challenge. I moved to a comprehensive school, and there I discovered a need for fresh approaches to achieve my goals, but again was buoyed by encouragement to find what worked for the young people in front of me. I realise now that I was incredibly privileged to have had such productive support and freedom to develop as I began my teaching career.

In the intervening period I believe we have seen the increasing politicisation of the nuts and bolts of education, from across the political spectrum, accompanied by a deprofessionalisation of teachers. While I would argue that broad education policy is rightly the domain of politicians, The Mathematical Association

has sought continually for the broad brush of policy enactment to be a debate informed by both the education professional voice and the nature of the discipline, and its details the responsibility of the subject-knowledgeable teacher who also knows the young people concerned. I increasingly believe that we would make a stronger and more effective case were we to work more closely with other professional organisations in mathematics education. I believe, too, that would benefit teachers of mathematics, who operate at the exposed frontiers of education policy, with apparently ever-increasing expectations: it would better support them in developing professionally and in particularly mathematically, and in nurturing a confidence in their professional identity.

Our MA conferences and day events are varied, high quality and often inspirational, but overwhelmingly, what emerged from teachers I interviewed for our recent work on the benefits of professional association activity, was the sense of community: this is *our* association, focused on mathematics education issues we care about, and a subject about which we're passionate. When teachers come to MA activity drained from apparently increasingly intensive and pressured terms, they get refreshed, recharged, revitalised, and affirmed about the value of what they do – and that is something we achieve as a wide community. Our efforts are too often replicated by other professional associations, and we do not fully benefit from our combined expertise. Overall, only a relatively small minority of (largely secondary) teachers of mathematics is involved in professional association activity: what can we do to involve and support the rest, including the large numbers of (usually non-specialist) teachers working in early years, primary or further education?

Council is about to embark on a renewed effort to find new ways of encouraging more of those involved in, or concerned about, mathematics education to participate actively: I hope that re-focusing will include consideration of ways of working more closely with others who share our goals of valuing and promoting mathematics and mathematics education. Financially, the association is robust, but if we pull together across the community I am confident we can make a *more* significant contribution to the health of mathematics and mathematical functioning in the UK.

My vision is one where all teachers of mathematics – at any stage - are appropriately subject-knowledgeable and confident. That would require them to be valued sufficiently that they stay long enough to develop truly effective teaching – and it would require a recognition that 'world class teaching' needs investment in career-long development, much of it of a subject-specific nature. I'd like to imagine a future where any 3-, or 13-, year old beginning to play with 'backward numbers' was encouraged to invent, to follow through, to challenge – and above all, to enjoy – their emerging ideas about mathematics: dare I suggest that would indeed lay the foundations for a truly mathematically-functional society. We live in 'interesting' times where the pace of change (not only in education policy!) is vast, and technologies

offer new, exciting and sometimes daunting possibilities. As an Association, we should, with others of like aims, be proactive in evaluating and harnessing those opportunities. We should be confident in challenging policy-makers where policies do not actively support the mathematical functioning of our society, and in particular, the functioning of our young people, as they might. And we should cherish those teachers and others who open mathematical doors. I wish Tom Roper, President 2017-18, and the incoming Council, every success in doing so.

Jennie Golding (President 2016-2017)

Chair's Report from Council

This is my second report as Chair of Council at the AGM and I intend to keep it brief! It has been a busy year but one which I have enjoyed immensely and I treasure the support of my colleagues, without whom The Mathematical Association would not flourish.

Council met four times since the last AGM, in June, September, December and March. In between those times Standing Committee met four times to deal with any unexpected business, or items that Council delegated to them. We agreed to increase the number of Members without Office from five to seven so that there is more flexibility to have a Council member at many events that take place.

This year we changed auditors. At the September Council meeting the Treasurer advised that we had received notification that the lead partner at BDO (our previous Auditors) would be leaving to work at Hacker Young in Nottingham and wanted to take the MA work with him. We had subsequently received two bids for the audit; one from BDO and one from the new firm (Hacker Young). There was a considerable saving to be made by moving and also in the level of audit required, so after discussion Council decided that it would be in the Association's best interest to move auditors. This year our accounts for the year ending 31 December 2016 showed a small gain. I am very pleased that in his final year as Treasurer, Bill Richardson has seen a positive result!

Membership is always a concern. Renewal notices were sent out on February 1 to those who had not renewed and a further reminder was sent out early in April. We would be delighted if each member could encourage someone to join during the coming year: membership is the life blood of our association and we need fresh blood so that we can keep up-to-date with current thoughts and needs.

The MA continues to work with the ATM and a small committee meets twice a year to discuss possible joint activities. Next year there will be just one big conference: BCME9 from April 3 to 6 at the University of Warwick, Celebrating Mathematics Education. BCMEs happen every four years and involve all members of the JMC. I hope to see you all there. We work closely with other mathematical organisations as well. The various committees are a vital part of the MA. Reports on their activities can be found in this Annual Report.

Based on suggestions received by members last year we invited Professor Dame Celia Hoyles and Professor Sir Michael Atiyah to become an Honorary Members and I am delighted to report that they all accepted. At the March 2016 Council meeting it was agreed that we have a procedure for appointing Honorary Members and so I had great pleasure in asking members at the AGM (and this will happen every subsequent AGM) for written proposals that include a case made for their suggestion, to be received by 15th May so that Council can consider and make its decision at the June Council meeting. An "Honorary Member" is 'any person who has made a distinguished contribution to mathematical education or who have provided outstanding service to the Association'. So, suggestions are welcomed at any time, but will be considered each June.

Paul Harris is now timed out as Editor-in-Chief. He has been on Council for 16 years in various posts: including Chair of Branches and Treasurer and never missed a Council meeting – a remarkable record. Similarly, Bill Richardson has spent five years looking after our finances and leaves that post with a healthy balance sheet to his credit. Peter Neumann reaches the end of his three-year term on Council as President Designate, President, and then Immediate Past President. I am eternally grateful for his excellent advice, encouragement and common sense. There is always one other person standing down at each AGM, namely the retiring President. Jennie Golding takes an active interest in MA affairs and her support for our association and the work she has put into our conference this year is tremendous. We heard her Presidential Address on the final day of conference. Jennie has one more year on Council. She is succeeded as President by Tom Roper.

Finally, I have now completed my second year as Chair. It is a great privilege and honour to work with all the MA members and mathematics teachers in one way or another. It has turned out to be even more time consuming than last year but has been both enjoyable and, at times, challenging. My sincere thanks to all members of Council as well as members of all the committees and subcommittees who give up a great deal of their own time preparing for, travelling to and attending meetings and generally furthering the aims of the Association. I should also like to thank Marcia Murray and her staff at HQ for all their support and hard work behind the scenes. Our membership owes them a great debt of gratitude. May the force ($F = MA$) be with you.

Peter Ransom (Chair of Council)

Branches Committee

The Branches Committee met twice during the year, once in October 2016 at HQ and also immediately after the MA Annual Conference at Royal Holloway, University of London, in April 2017. At the October meeting reports were received from committee officers. Appointments were made to officer roles for the year April 2017 to April 2018. Those appointed were me as Chair, Rob Smith (Vice-Chair), Paul Harris (Secretary), Cindy Hamill (Treasurer) and David Myers (Youth Activities Officer). Discussion then centred on publicity with reference to MA

branches and branch events. The proposal of a branches' committee bursary for the 2017 MA Annual Conference was discussed and approved. Branch representatives then gave accounts of their recent events and outlined their upcoming events. The short meeting after the annual conference in April consisted of approving the minutes of the October meeting, discussing matters arising and receiving reports from committee officers.

There is a tremendous amount of work done by the local organisers of MA branches. They do this work on a voluntary basis and devote much of their time to ensuring that events happen and run smoothly. It would be a great shame if their work was not given as much publicity as possible. So we have placed great importance on the regular updating of the Branches section of the MA website, and the Branches section of MA News, throughout the year. Other areas of the website which reference branches' matters and personnel have also been updated. The editions of MA News throughout the year have contained details of many branch events. Email alerts have always been sent from HQ to MA members about upcoming events in their locality. Marcia Murray (Senior Administrator) and her colleagues at HQ, together with Sue Waring (MA News Editor), have worked with me and done an excellent job in this regard. Details of future branch events are advertised in the MA E-Newsletter, compiled by Chris Pritchard (MA Secretary), which is emailed to members each month. Messages about upcoming branch events continue to be sent out on Twitter. These Twitter messages have been sent by Rob Smith (Vice-Chair of Branches Committee) and David Miles (Chair of Publicity and Media).

There are currently ten active MA local branches. The branches are Birmingham, Cambridge, East Midlands, Exeter, Gloucester, Liverpool, London, Meridian (based in Reading), Sussex and Yorkshire. Seven of these are Joint Branches with the ATM. These branch locations give a good geographical spread across England. It is a great credit to the local organisers that a total of 37 branch events took place during the year. Fewer events were organised during the Summer Term partly due to both organisers and delegates preparing for public examinations. Branch organisers are also preparing their programmes for the following academic year during this period. During the year three prominent members of MA Council offered to give talks to branches and these offers were taken up. The Council members were Jennie Golding (MA President), Chris Pritchard (MA Secretary) and Tom Roper (MA President Elect). It was recognised that closer collaboration with maths hubs may offer the best way forward in any development of new MA branches. Rachael Horsman (Chair of Teaching Committee) has helped to try and achieve this closer collaboration with hubs in regard to new branches.

David Myers is the Youth Activities Officer on Branches Committee. He was confirmed in this role at the committee meeting in October 2016. David organised a

mathematics problem solving day in December 2016 for students from secondary schools in the Durham area. The venues for the day were Durham Cathedral and the nearby St Chad's College. Peter Ransom (Chair of MA Council) was the keynote speaker and Peter made further contributions during the day. The day was very successful and David wrote a report on it which is featured, on pages 13 and 14, in the February 2017 edition of MA News. On a separate note David is planning to create a database with details of all branch events which are open to school students.

Branches Committee continues to try and encourage local branch members to attend the MA Annual Conference. Again, this year branches were invited to nominate members who had never been to an Annual Conference before to apply for a bursary of £440 to cover the cost of one delegate place. Jon Howlett, a primary school teacher in London, was successful in his nomination and subsequently attended the event at Royal Holloway. Jon's report of his experiences at the Conference was received shortly after the event and is due to be published in MA News and elsewhere as appropriate in an attempt to further promote the advantages to members of attending. It is hoped that this initiative will be repeated next year.

In summary the focus this year has been on giving as much support as possible to existing MA branches. Hence it has been a year of consolidation rather than expansion. A number of positive developments have taken place however. The figure of 37 branch events during the year is impressive. As you will know this equates to an average of almost four events per branch. Updating of all matters relating to branches on both the MA website and in MA News was important as was giving as much additional publicity as possible to branches and their events. News of the problem-solving day in Durham may yet inspire similar events elsewhere in future.

Keith Cadman (Chair of Branches)

Annual Conference 2017

We were very pleased to return to Royal Holloway, University of London for our annual conference at Egham this year. We were last there in 1994. Oxford University Press was again the main sponsor of the conference this year and their support was most welcome, together with that of Haese Mathematics and Casio Electronics. Accommodation was on site in the Founder's Building just opposite the Windsor Building where all the sessions took place or, just about five minutes' walk from the centre and the weather was not a problem. Most attendees arrived on Friday, 7th April, though some arrived on the Saturday. On the Friday afternoon for the twenty or so early arrivals, Florence Nightingale, yes, THE Florence Nightingale (aka Noel-Ann Bradshaw), gave a fantastic guided tour of Royal Holloway, illustrating this with some of her statistical work.

The Opening Session was given by Liz Meenan who, to fit in with the conference theme of '*Common denominators*', entitled her session '*Geometry for all through paper folding*' and this had us all actively involved in the session

talking about reconstructing some of the amazing patterns Liz has seen in buildings around the world. This was an excellent start to the conference that engaged us in both serious discussion and active engagement. The next hour was an opportunity for newcomers to learn about what they might experience at conference, or to attend the AGM, a full report of which will appear in MA News.

After dinner Gerry Leversha kept us well and truly entertained with a themed quiz, based on an imaginary school's timetable. This was a great way to finish the day as everyone managed to find something that suited their strengths, and was very much appreciated by all those who took part.

On the Saturday Debbie Morgan's plenary session (*What is mastery, why does it matter and what are teachers doing where it's working well?*) started the day with something that had us discussing for quite a long time afterwards. Debbie's presentation is available (free) on the MA website at <http://www.m-a.org.uk/2017-Conference-Session-Downloads> This was followed by two slots (separated by a refreshment break) where attendees chose the session (in advance of the conference) they wished to see. There was a choice of nine sessions in each slot with two primary, two secondary, two tertiary, two general and a technology session. A buffet-style lunch was served in the Publishers' Exhibition area so that we had a good opportunity to acquaint ourselves with current materials that are available.

The afternoon session was structured the same way with two slots, each of nine sessions separated by a refreshment break. The final slot of the day was an open meeting of Teaching Committee (TC) which is one of our great strengths of the MA. Aably chaired by the Chair, Rachael Horsman, TC has subcommittees to deal with primary, 11-16 and Post-16 mathematical education. TC submits responses to consultations and participates in dialogue with government. They reported that there are times when the Government has moved after receiving our letters. Our position on various matters can be seen on the MA website under We say. For part of the open session we split into three groups: primary, secondary and tertiary to discuss some of the challenges faced in each sector.

That evening we had the President's Reception in the Picture Gallery and were shown some of the pictures in the collection there before having dinner in the Founder's Dining Room. This was followed by a Saturday night special by Ben Sparks and David Acheson who gave us a mixture of mathematics and live music: a perfect end to a great day.



The final morning started with Jennie Golding's Presidential Address: *Is it mathematics or is it school mathematics?* Jennie's session will be printed the November edition of The Mathematical Gazette.

This was followed by another two slots of parallel sessions and then lunch. After lunch, we had a final ennead of sessions and then Rob Eastaway's Closing Lecture '*Solving outside the box: creativity in problem solving*' during which he had us gazing in wonder at various images of mathematical patterns and attempting to solve various problems. This brought to a close another excellent conference that was followed by meetings of Branches Committee. My thanks go to all the speakers, sponsors, organisers, helpers and delegates who made this such an enjoyable event. Particularly to Jennie Golding who worked so hard throughout the year to make this such a great event with a superb variety of sessions. Most speakers' sessions resources are now on the MA website at:

<http://www.m-a.org.uk/2017-Conference-Session-Downloads>.

I wish the next Chair of Conferences, Cherri Moseley, every good wish in taking on the role of Chair of Conference at the AGM.

Peter Ransom (acting Chair of Conference)

Professional Development Committee

During the year 2015-16 the Professional Development Committee met three times formally though there have been several informal meeting and phone calls related to particular events. Our focus continues to be the provision of high quality professional development for classroom teachers and we have been successful in our re-accreditation as an NCETM Standard Holder for providing Maths CPD. We find ourselves working in very challenging times, with a number of other providers such as the Maths Hubs and FMSP being able to offer CPD at little or no cost. In addition, many CPD providers are finding it particularly difficult to fill courses during the school day as many teachers are not allowed out of school.

As a committee, we organise our two main conferences on a Saturday so teachers can attend without impact on cover for their schools. Whilst some schools support them financially to attend, many do pay themselves and we continue to be impressed by their enthusiasm and support for our events.

The 12th Annual Scottish One-day Conference for Teachers of Secondary Mathematics took place at the University of Stirling on Saturday 3 September 2016. Jennie Golding led the keynote session, with 15 other speakers leading workshops across four sessions. Just under 100 delegates attended, mainly from the central region but some came from as far north as Wick and the Highlands. The attendance figures were lower than last year, but nonetheless this was a very successful day. Plans are in hand for this years' conference on 30 September at which Tom Roper will lead the plenary session. Bill Richardson is

again taking responsibility for this day with many of the speakers already booked and is on a day which is not so close to the holidays and hopefully more popular with teachers.

The theme for this years' Primary PD Day was 'Inspiring Primary Mathematics' and Ems Lord from Nrich certainly lived up to the title in her keynote session. The conference took place on 12 November in High Wycombe and again we had very positive feedback. At the suggestion of previous delegates, we included two sessions for Early Years and these were well received. Plans are underway for this years' conference at Wycombe High School on 11 November with Problem Solving and Reasoning as the theme.

With changing A Level specifications in September 2017 requiring all students to be taught pure mathematics, statistics and mechanics, we trialed an A Level Mechanics day for those teachers who may not have had the opportunity to teach this aspect of the course. Peter Ransom and Tom Roper together with Howard Fay and Carl James, organised a day at Leicester Grammar School on 29 October and whilst numbers attending was relatively small the day was rated very highly. We are looking to run this again elsewhere in the country in areas where the FMSP are not offering something similar.

Following promotion on Twitter we had a significant interest from people interested in joining the PD Committee. Three people whose background and experience best complements that of our current team, have joined us and one has even volunteered to take on the role of secretary!

Julia Brown (Chair of Professional Development)

Publications Committee

Many thanks to the committee (Michael Fox, Paul Harris, Mary Ledwick, Barry Lewis, Cherri Moseley, Bill Richardson, Sue Waring) for their support and expertise, to our many authors who make it all possible, and to Carol Mackerness at HQ who took over in July 2016 when Lisa O'Donnell left the MA's HQ team.

Our task, simply described, is "*to publish, at a profit, innovative and exciting publications that further the aims of the Association.*"

The past year has been yet another year of success and growth for the sale of MA books and resources. The *GCSE Revision Cards* by Mary Ledwick, which offer sets of cards for both Foundation and the Higher-tier examinations, continues to play its part in this success. However, other titles continue to sell well – those newly published and all those with enduring popularity in the MA's back catalogue.

The new titles published between April 2016 and April 2017 include:

- *A Square Peg In A Round Hole*, Chris Pritchard, 2016
- *Challenge Your Pupils 3*, edited by the PMC Management Team, 2016
- *GCSE Revision Cards Foundation* (new for the 2017 exam), Mary Ledwick, 2017
- *GCSE Revision Posters*, Mary Ledwick, 2017
- *More Puzzles from Pie*, edited by Wil Ransome, 2016
- *Padlock Challenges Geometry*, Rachael Horsman, 2017
- *Questions Pupils Ask*, Colin Foster, 2017

Sales through Amazon continue to grow. Reviews posted on Amazon really do work in the MA's favour, not only by boosting book sales but in attracting membership too. Roughly 75% of our sales are to non-members.

We look forward to the continuing success, finding new ideas and the people to develop them through to publication. All ideas welcomed.

Publications Committee

Editorial Board

The Mathematical Association continues to produce high-quality journals that contain interesting and useful articles for teachers who teach at all levels. In 2016, the Association published five editions of *Mathematics in School* (aimed at teachers working in secondary schools), three editions of *Primary Mathematics*, three editions of *SYMMetryplus*, and three editions of *The Mathematical Gazette*, the Association's general interest mathematical journal. The Association also published three editions of *Mathematical Pie* and three editions of its members' newsletter, the *MA News*. Publication of the on-line journal also continues with three editions per year.

This year, 2016, was an uneventful year for the journals with no major changes to the Editorial teams and no changes to the productions schedules. The MA continues to collaborate with CUP over the production of *The Mathematical Gazette*. Also, all the editions of *The Mathematical Gazette* and *Mathematics in School* over 5 years old continue to be available in electronic form from JSTOR. This continues to provide a good income stream for the MA. Janet Powell continues to generate plenty of advertising income from the Journals.

This is my final report as Editor-In-Chief as my term of office ended at the 2017 AGM. I have been grateful to the Editorial and Production teams who work on the journals throughout my time as Editor-in-Chief as without their dedicated and hard work the Association would not be able to publish its journals. In particular I would like to give thanks to John Berry, Mary Clark, Stan Dolan, Alan Edmiston, Erik Gooding, Kay Hayden, Ray Huntley, Andrew Jobbings, Richard Kirby, Nicole Lane, Gerry Leversha, Adam McBride, Helen Morris, Cherri Moseley, Grant McCleod, Nick Lord, Janet Powell, Chris Pritchard, Peter Ransom, Wil Ransome, Bill Richardson, Tom Roper, Owen Toller, Sue Waring and Tina Webb for all the work that they do.

Lastly, I would like to wish all the editorial and production teams all the best for the future and hope that the journals continue to be successful under the guidance of my successor.

Paul Harris (Editor-in-Chief)

Primary Mathematics Challenge

For the second year running, and despite our best efforts there was a drop in numbers taking part in PMC this year. 63000 pupils entered. We have asked schools who participated in 2015 but not 2016 for their reasons for dropping out and hope to have some information back from that survey.

We were pleased with the spread of results for the November paper. 21% scored 16 or over and 72% scored 11 or over. (see below.)

Mark	0-5	6-10	11-15	16-20	21-25
% of pupils	3	24	51	15	6

We made a policy decision to increase the number invited to take part in the February Bonus Round, inviting 1932 pupils.

1803 Bonus Round OMR sheets were received in time to be entered into the February results. The distribution is shown here:

Bonus Round

Mark	0-5	6-10	11-15	16-20	21-25
% of pupils	2	16	44	33	5

We decided to increase the proportion of award winners, so this year we awarded: 483 bronze, 302 silver and 93 gold awards. We have changed from medals to lapel badges, which children can wear and display.

We recognise that PMC provides a useful income stream for the MA, but the primary purpose of the team is to produce a valuable and significant resource for schools, in line with the MA mission statement. On this basis, and in recognition of the financial difficulties which we know primary schools face we recommended a reduction of 10% in the price of the PMC packs, with the aim of increasing participation.

The website works well for schools ordering on-line, but PMC has had little presence on the MA main site. We are pleased to see that this has now been dealt with and PMC is visible on the main page.

We have recruited new members to the problem-solving team this year, but people's commitment varies and we are always ready to welcome enthusiastic younger members to the team.

Alex Voice does an excellent job in compiling the papers, taking the lion's share of the work in producing the two papers. We are grateful for all that he does for PMC.

The team at MAHQ have, as ever, given tremendous support to the work of PMC. Alice Hall has 'grown' into her role as PMC coordinator and has proved a very useful member of the team. This year she initiated a poster

competition for PMC which brought in more than 100 entries which were on display at the Annual Conference. The winning poster is below.



Lesley Jones (Chair of PMC Management Team)

Library Committee

Wittgenstein Archive of Francis Skinner:

There is no further progress to report on Professor Gibson's work to produce a complete published edition of the Archive. The loan agreement with Trinity College Cambridge continues and annual renewal has been granted for 2017-18.

Donation:

Six new titles for the MA Library have been gratefully received from Robert Holder.

Cataloguing and Relocation:

The review of over 1600 MA books on the open shelves which are dated 1851-1900 has been completed and work is ongoing to upgrade all the catalogue entries for around 150 books transferred to the Special Collection. Six of these books have received conservation treatment in 2016 at a cost of £130 and a further seven books are being treated in 2017 at a cost of £200. The new electronic library service system is now fully implemented and includes all the MA catalogue entries via a wide-ranging search facility. Work is ongoing to make the public interface online more specifically informative in relation to MA catalogue details.

Links with the STEM Centre in York:

The MA is now significantly featured in the e-library of the STEM Centre alongside the Centre's full accommodation of all current MA publications and print periodicals.

New Agreement between the University of Leicester Library and the MA, 2017-2022:

A new 'service level agreement' has been accepted by the MA and the University for five years, 2017-2022. Significant changes are: no duplicates of MA publications to be given to the University Library which will have access to all the MA Library copies; free borrowing entitlement for MA members increased from four to ten items at a time and postal loans of up to ten items per

academic year, again free apart from the return postage costs.

Special Collections Exhibition:

The University Library's latest exhibition alongside the Special Collections suite is devoted to 'Victorian Schooldays' from March to June 2017. The exhibition includes manuscript exercise books from the MA's John Hersee Collection alongside other school books from the Special Collections. The exhibition has been publicised in the MA eNews and in the *Leicester Mercury* and is freely open to the public.

Mike Price (Librarian, Chair of Library Committee)

Teaching Committee

Another busy year for everyone and lots of news has been hitting the press regarding maths education. We are very pleased to welcome two new members; Dean Rowley the Maths Lead from the Suffolk/Norfolk NCETM Maths Hub and Emma Bell from Franklin Sixth Form College (@El_Timbre). We're thrilled to be building a strong link with a maths hub and to have FE represented on Teaching Committee. We're very thankful to Rob Smith for stepping into the role of secretary for the committee. A number of new members have also joined the subcommittees following a successful Twitter campaign. We are thrilled to see some many front-line teachers joining these groups and are excited to be working with so many new faces.

It has been a challenging year with new GCSEs being taught, a plethora of grading revelations (if that's the right word), a lack of A level specifications, and no Smith Review (yet). Very recent announcements including the change to pass at GCSE and resit rules for GCSE will be discussed at our open meeting at the annual conference.

The committee has responded to a variety of consultations and calls for evidence including;

- A letter to Justine Greening highlighting issues regarding the KS2 standards
- A letter to Justine Greening highlighting the reduction (per-capita) in year 7 catch up funding
- A letter to Justine Greening regarding Year 7 Progress Checks
- A response to Ofqual's Setting the Grade Standards
- Evidence for the Primary assessment enquiry

My thanks to all those who contributed to the construction of these documents, whether from the greater TC family or from Council. Our input to consultations is essential and only made possible by active members supporting the work of TC.

Following various letters and submissions of evidence members of the joint primary group have also been invited to speak with Nick Gibb.

We have also, through Jennie Golding, President of the MA, raised our concerns with The Meeting of the Mathematical Subject Associations (MMSA) about the multiple university entrance tests that seem to be growing in number. The challenges this poses both financially and in teaching resources could be a barrier to some applicants.

Whilst completing these tasks the subcommittees continue to produce some excellent publications including the very popular MA Calendar and worked on further publications with Oxfam.

A special mention should go to Emma Cooke and the rest of the 11 – 16 sub-committee for their 60 Second surveys. Not only have these been a great source of information for our work and created debate, they have also created a stir in the wider world. Several press organisations including the TES have picked up on the results.

Our Twitter and Facebook audiences continue to grow. Our thanks to David Miles, whose tireless work on the Twitter feed has resulted in some lively debate and continued to increase our profile with teachers.

As ever a huge amount of thanks goes to the subcommittee Chairs and their members, to our small Advisory Group and to Council. TC members have worked diligently to meet the challenges we have faced and the contributions of all, particularly David Miles have been greatly appreciated. As members terms come to an end we are looking for new fresh faces to step up and take an active role in the work of The MA, and would welcome any interested parties.

The Primary, 11 – 16 and Post-16 subcommittee reports will be published in the next issue of MA News.

To contact them please email;

Primary Subcommittee

Chair Alison Borthwick - tc-121@m-a.org.uk

11 – 16 Subcommittee

Chairs Oliver Thomson, Steve Edwards - tc-132@m-a.org.uk

Post-16 Subcommittee

Chair Anne Baker - tc-129@m-a.org.uk

Rachael Horsman (Chair of Teaching Committee)

Membership Committee

What we offer in terms of membership is under constant review to ensure that we retain existing members and encourage new members to join us. During the last year, we have continued to explore the possibility of e-membership. Such a membership would require some rather widespread changes. For example, e-members are likely to want to receive their journals in electronic format and we do not currently publish in that format. We are therefore continuing to look at the wider issues before narrowing it down to what we can offer to current and existing members. The membership pages on the website

will always give clear and current information on what you get for your membership and what it costs. Some people and institutions choose to buy our journals without becoming a member of The Mathematical Association. This is known as a direct subscription and there is now more information on this option on the website.

Every year we contact all the various universities and groups which offer mathematics at degree level and teacher training institutions to invite those who are studying mathematics or aiming to teach it to join us. We also contact Teaching Schools. We continue to work with all the Maths Hubs and provide all of them with a third year of free membership.

We continue to regularly advertise The Mathematical Association in magazines such as *Teach Primary* and *Teach Secondary* and work closely with other mathematics organisations, keeping in touch and supporting each other as well as working together on specific projects. This year's marketing campaigns focused on contacting all Leicester area schools to raise awareness of The Mathematical Association as local to them and to encourage them to join us. Many personal members were sent a copy of one of the MA journals to which they do not subscribe to encourage them to extend their membership. As always, results are hard to quantify.

All members receive our monthly eNews letter help to keep them up to date with mathematics related news. Our use of Facebook, twitter and other social media has grown over the last year, with a vast increase in the numbers of twitter followers thanks to the efforts of the Publicity and Media committee.

The Membership committee continues to work hard to ensure that those who are interested in mathematics and mathematics teaching are fully aware of the benefits of membership and find the process of joining the MA both straightforward and reasonably priced.

Cherri Moseley (Chair of Membership)

Publicity & Media Report

I am pleased to report that productive working relationships have been forged with a number of education journalists over the course of this year. In July 2016, the TES ran a two-page spread highlighting the key outcomes of the recruitment and retention survey created by the 11-16 subcommittee of Teaching Committee. This article was picked up by The Daily Mail and subsequently attracted hundreds of comments on their website. A follow-up piece suggesting possible ways forward appeared in TES in August 2016. In the same month, TES carried an article reporting our views on Year 7 catch-up funding.

In March 2017, TES asked us to respond to Ofqual's comments on the accreditation process for new A level specifications in mathematics and further mathematics. A

Twitter poll we created in April 2017 provided indications of a possible decline in applications to study both reformed A levels and prompted coverage in TES and Schools Week. In the same month, we provided a comment to Schools Week on the effectiveness of the Golden Hello Scheme for Further Education mathematics teachers.

Through our @Mathematical_A account, we have continued to fully participate on a daily basis in the vibrant Twitter mathematics community and, on a number of occasions, we have broken important news stories and helped to shape the social media debate. Over one year, our number of followers has increased by 50% to almost 12,000. The Primary Mathematics Challenge is represented by a second account @PMC_Maths.

Our Facebook group

www.facebook.com/groups/136275943093334/ is maintained by Rachael Horsman and now has over 1,750 members. We also have a presence on LinkedIn and YouTube.

Delegates at the 2017 Annual Conference will be familiar with the promotional highlighters and sticky notes we introduced this year and the MA bookstand has been a fixture at numerous Conferences and events throughout the year. This would not have been possible without the efforts of the many members who have given freely of their time to assist our staff in the marketing of our publications and resources.

As this is my final Publicity & Media Report, I would like to take the opportunity to thank the members of Council and Teaching Committee and the staff at our Leicester Headquarters who unfailingly responded promptly and effectively to my requests for assistance and advice throughout the year.

David Miles (Chair of Publicity and Media)

United Kingdom Mathematics Trust (UKMT)

The core activities of the UK Maths Trust continue to thrive. Entries for all three of the main competitions increased in 2016-17, both in terms of schools entering pupils and the overall number of pupils. For those who like details, the specific figures were as follows: Senior Challenge 112 350 (from 2253 schools), Intermediate Challenge 267 350 (from 3322 schools) and Junior Challenge 307 400 (from 4064 schools). This year, to celebrate our 20th birthday, UKMT ran a “20 for 20” offer at both Intermediate and Junior level, offering schools who had not entered these challenges for at least 5 years 20 free entries. More than 130 schools responded positively to this and some ordered extra packs as well. Thanks to a grant from the London Mathematical Society, UKMT hope to run a similar scheme in 2017-18. For students who perform well in the Challenges, the follow-up competitions provide an extra opportunity to solve mathematical problems from the Junior Kangaroo and the

Junior Maths Olympiad for Years 7 and 8 (and below) through the three papers that make up the Intermediate Olympiad Group and the Grey and Pink Kangaroos for Year 9, 10 and 11 to the Senior Kangaroo and the ultimate challenge of the British Mathematical Olympiad (BMO). A new competition, the Junior Algorithmics Challenge, for Year 7 and 8 pupils is being developed and a pilot of this competition will take place later in the year with the intention to run the full competition the following year. As well as the individual competitions, the Team Mathematical Challenges have continued to flourish with nearly 1300 schools taking part in the Senior Team Maths Challenge. This culminated in a win at the National Final in February for Ruthin School following on from their being involved in a three-way tie for the title the previous year. The Team Maths Challenge itself has also prospered this year and the final, at which 88 of the top young mathematical teams will battle out for the title, will take place in London on June 19th this year. The UKMT also produce a set of Primary Team Maths Resources (PTMR) every year, to facilitate secondary schools organising and running their own team events for feeder primaries, and this year’s materials are available for downloading from the UKMT website (www.ukmt.org.uk). The MA’s Primary Mathematics Challenge is recommended as an additional enrichment event for primary children in UKMT’s instructions for the PTMR. On behalf of the MA, the UKMT once again marked the Bonus Round of the MA’s Primary Mathematics Challenge (PMC) using our staff and optical mark reader and is happy to continue to do so in the future. A representative from UKMT had a stand at the recent MA Conference at Royal Holloway. UKMT has also run or plans to run many enrichment events including Maths Circles (2 day enrichment courses for Year 10 pupils – four of which have happened already this year with five more planned for later in the year) and National Summer Schools (four per year - including one for girls). UKMT would not be successful without the support of its volunteers and helpers and thanks are due to all who help make it as successful as it is.

David Crawford (MA representative)

The British Mathematical Olympiad Committee

At the International Mathematical Olympiad in Hong Kong in July 2016 the UK team gained two Gold and four Silver medals, finishing 7th equal among the 109 participating countries. Their achievement, the best result since 1996, was celebrated at the Science Museum in September, when Dr Zuming Feng gave a discussion of a variety of mathematical problems under the title “From Classroom to Contest”. Planning continues for the 2019 IMO in the UK.

The UK team of four at the European Girls Mathematical Olympiad in Romania in April 2016 also did well, bringing home a Gold, a Silver and two Bronze medals, placing them 7th out of 39 teams. At the equivalent event this year in Zurich the team did similarly, with one Gold and three Bronzes, 8th out of 44 countries.

The other International competitions of the year were the Balkan Mathematical Olympiad in Albania in May 2016, which brought two Silver and four Bronze medals for the UK (7th out of 19); and the Romanian Master of Mathematics in Bucharest in February 2017, with two Gold medals, a Silver, a Bronze and two Honourable mentions (awarded to a contestant for a complete solution to a question when no medal is achieved); this gave an excellent 2nd position out of 19 countries. There are a number of other international competitions, but we are not minded to participate in these at present.

Training camps in Oxford, Hungary, Cambridge and Tonbridge were held as usual through the year. The mentoring scheme continues at its four levels for various ages and levels. Summer Schools for pupils from Years 11 and 10 were held, two in Leeds and two (one for girls) in Oxford.

The home competitions were held as usual: the Mathematical Olympiad for Girls in October 2016, the British Mathematical Olympiad Round 1 in December, Round 2 in January 2017.

Philip Coggins (MA Representative)

Association Articles and Regulations

These documents can be viewed at:
<http://www.m-a.org.uk/articles-and-regulations>

The Council from April 2016 to April 2017

Presidents

President	Jennie Golding
Immediate Past President	Peter M Neumann
President Elect	Tom Roper

Officers

Chair of Council	Peter Ransom
Secretary	Chris Pritchard
Treasurer	Bill Richardson

Chairs of Committees

Branches	Keith Cadman
Conferences	Joyce Brown
Editor-in-Chief	Paul Harris
Professional Development	Julia Brown
Publications	Michael Fox
Membership	Cherri Moseley
Teaching Committee	Rachael Horsman
Publicity and Media	David Miles

Members-without-Office

Ray Huntley	Dave Pountney
Rob Smith	Barry Lewis

The Company Secretary

Bill Richardson

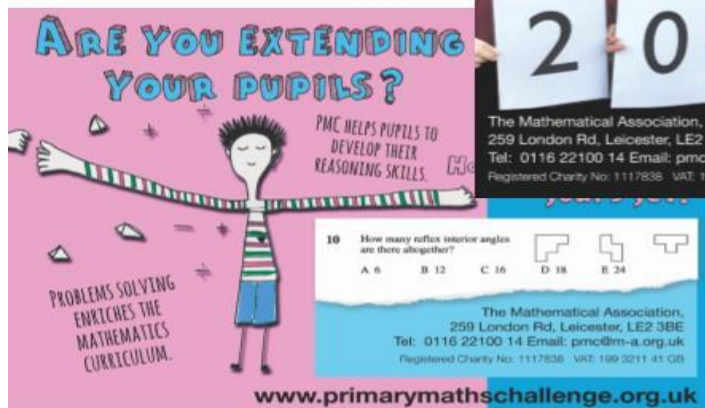
Headquarters

The Headquarters Team during 2016-2017:

Senior Administrator	Marcia Murray
Finance Officer	Linda Medhurst
Membership Officer	Charnjit Seehra
Secretarial Assistant	Lisa O'Donnell*
Secretarial Assistant	Carol Mackerness*
Sales & marketing	Alice Hall

**Lisa resigned June 2016. Carol employed July 2016.*

Samples of the new artwork for the next year's PMC campaign.



**THE MATHEMATICAL ASSOCIATION
STATEMENT OF FINANCIAL ACTIVITIES (INCORPORATING INCOME & EXPENDITURE
ACCOUNT)
FOR THE YEAR ENDED 31 DECEMBER 2016**

	Notes	Unrestricted Funds £	Restricted Funds £	Total Funds 2016 £	Total Funds 2015 £
Income from:					
Donations – gift aid		14,401	-	14,401	39,952
Charitable activities:					
Members' subscriptions		139,528	-	139,528	153,996
Gazette		34,557	-	34,557	27,928
Editorial board		38,620	-	38,620	42,215
Publications		68,662	-	68,662	62,355
Annual conference		45,095	-	45,095	29,631
Primary Maths Challenge		69,770	-	69,770	63,129
Professional development income		15,363	-	15,363	20,596
Branch income		3,859	-	3,859	4,980
		<u>415,454</u>	<u>-</u>	<u>415,454</u>	<u>404,830</u>
Investment income		117	-	117	413
Other:					
Rent receivable		5,901	-	5,901	5,614
Miscellaneous income		-	-	-	121
		<u>435,873</u>	<u>-</u>	<u>435,873</u>	<u>450,930</u>
Expenditure on:					
Charitable activities		435,513	-	435,513	472,666
		<u>435,513</u>	<u>-</u>	<u>435,513</u>	<u>472,666</u>
Net income (expenditure) and net movement in funds for the year		360	-	360	(21,736)
Other recognised gains					
Gains on revaluation of fixed assets		-	-	-	60,000
		<u>360</u>	<u>-</u>	<u>360</u>	<u>38,264</u>
Reconciliation of funds					
Total funds brought forward		553,639	6,500	560,139	521,875
		<u>553,999</u>	<u>6,500</u>	<u>560,499</u>	<u>560,139</u>

All income and expenditure derive from continuing activities.

The comparative figures for the year ended 31 December 2015 are all derived from unrestricted funds.

THE MATHEMATICAL ASSOCIATION

BALANCE SHEET
AS AT 31 DECEMBER 2016

	Notes	£	2016 £	£	2015 £
Fixed assets					
Tangible assets			339,498		344,798
			<hr/>		<hr/>
Current assets					
Stock		25,921		16,356	
Debtors		56,123		26,884	
Cash at bank		235,825		248,818	
		<hr/>		<hr/>	
		317,869		292,058	
Creditors: amounts falling due within one year		(96,868)		(76,717)	
		<hr/>		<hr/>	
Net current assets			221,001		215,341
			<hr/>		<hr/>
Total assets less current liabilities			560,499		560,139
			<hr/>		<hr/>
Represented by					
Restricted funds			6,500		6,500
Revaluation reserve			188,400		192,000
Unrestricted funds			365,599		361,639
			<hr/>		<hr/>
			560,499		560,139
			<hr/>		<hr/>

For the year ended 31 December 2016, the charitable company was entitled to audit exemption from an audit under section 477 of the Companies Act 2006.

The trustees have not required the charitable company to obtain an audit of its accounts for the year in question in accordance with section 476 of the Act.

The trustees acknowledge their responsibilities for complying with the requirements of the Companies Act 2006 with respect to accounting records and the preparation of accounts.

The financial statements were approved and authorized for issue at the Annual General Meeting and were signed on its behalf on 7th April 2017.

Mr P H Ransom
Chair of Council

Mr W P Richardson M.B.E.
Treasurer

Company Registration Number: 05729264
Charity Number: 1117838
