Post-16 Group Newsletter November 2010

The Mathematical Association and The National Association for Numeracy and Mathematics in Colleges working together to support post-16 mathematics education

What is the Post-16 Group?

The Post-16 Group is a joint initiative of **The Mathematical Association** and **The National Association for Numeracy and Mathematics in Colleges**. It aims to support teachers of post-16 learners of mathematics through the dissemination of resources and the provision of professional development in the use of those resources.

Click **here** to read more.

Skilled to go

Skilled to go is an excellent website which has resources, aimed at adults but suitable for mature teenagers, looking at consumer issues while developing numeracy and literacy skills.

Click **here** to read more.

Maths Moments …

The Learning and Skills Improvement Service (LSIS) has developed a series of **Mathematical Moments** which focus on a mathematical topic and offer suggestions for activities, prompt you to anticipate, and then reflect on the learners' responses, and finally offer some follow-up ideas. The topics cover all levels from Entry to Level 3.

Click **here** to read more.

… and Math Moments

Mathematical Moments is also the title of a series of posters from the American Mathematical Society that promote awareness of the role that mathematics plays in science, nature, technology and human culture.

Click **here** to read more.

We are not alone

Apart from the Post-16 Group, and its sponsoring organisations, others are active in providing support for teachers of mathematics and numeracy post-16. Here we highlight the professional development courses provided by **MEI**.

Click **here** to read more.

Short notices

MA Conference | NANAMIC CPD Days | Equals | Alternative to GCSE Maths | Maths in a Box | Engineering Mathematics Networks | Your contributions are welcome

Click **here** to go to the top of the newsletter.

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We see our role as being to help make teachers better aware of what resources are available (and to plug gaps where we feel they exist) and to provide teachers with support in making the best use of resources. Our ambition is to do this across the spectrum of post-16 provision with its wide variety of contexts and courses.

The present pilot initiative is led by a Steering Group made up of three representatives from each of the associations. Working Groups have been established to develop professional development days (and supporting resources) on Engaging Learning in Level 3 Mathematics and on teaching the new GCSEs in Mathematics. The first professional development day, *Engaging the Level 3 Learner*, is planned for early March; click **here** if you would like to receive further details when they are available. To support its work, the group is also developing a website and an electronic newsletter.

For more information about the Post-16 Group please visit our **website** or **email** us.

Click **here** to go to the top of the newsletter.

The Mathematical Association
Supporting Mathematics in Education

Click **here** for more information.

Functional Skills CPD Events

Thursday 18th November, The Crewe Arms Hotel, Crewe

Friday 3rd December, Queen Mary's College, Basingstoke

Level 5 Numeracy Qualification Teachers' Network

forthcoming meetings

Click **here** for more information.

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Skilled to go

Skilled to go is an excellent website which has resources, aimed at adults but suitable for mature teenagers, looking at consumer issues while developing numeracy and literacy skills. Percentage discounts, credit agreements, price per unit, reading a bill, running a car – lots of calculations many of them set in either a research or game setting. The resources also encourage the use of Excel spreadsheets.

Registering on the website is free and all the resources can be freely downloaded.
NB For those who may already be registered, two new modules were added in July.

Run by the Office of Fair Trading the resources include the option of physical resources as well as the web based elements. You can check out the **evaluation** but the results of the pilot show that students made gains in consumer skills and knowledge and felt more confident in consumer situations

Skilled to go is designed for learners at Entry 3 - Level 2, that is GCSE (Access 3 and Intermediate 1 and 2 in Scotland), and includes content for ESOL learners. It has tailored versions for England and Wales, Scotland and Northern Ireland.

LLU+ created the resources, which help learners to develop the skills, knowledge and confidence to choose a mobile phone, keep safe online, avoid scams or deal with the challenges of buying and running a car. With new content added in July 2010, there are now five modules to download, with comprehensive Teachers' notes, a User guide and curriculum referencing to the adult core curricula and Functional Skills standards.

If you would like the OFT consumer education team to run a free session at your learning centre to introduce teachers to Skilled to go and give you and your colleagues a chance to try out the resources, then **email them**.

To get the most out of a session you'll need to have a venue with internet access, projector and laptop and the room set up cabaret style. They offer sessions of one hour, one and a half hours or two hours in duration. They require a minimum number of 15 for a session but if you host they will invite other teachers.

Click **here** to go to the top of the newsletter.

Equals

Equals is a resource published by The Mathematical Association for those working to ensure that all learners, including those with special needs, will benefit from mathematics. It includes updates on issues affecting practice, descriptions of teachers' experiences, reviews of books, packs and equipment and practical ideas with materials to photocopy. At present, it is produced three times a year but from 2011 it will be available free online.

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Maths Moments …

The Learning and Skills Improvement Service (LSIS) has developed a series of **Mathematical Moments** which focus on a mathematical topic and offer suggestions for activities, prompt you to anticipate, and then reflect on the learners' responses, and finally offer some follow-up ideas. The topics are addressed at levels ranging from Entry to Level 3.

The topics covered are drawn from:
- algebra (12 topics)
- number (19 topics)
- shape and space (23 topics)
- statistics (16 topics)

The topics include:
- Decimals, Percentages and Money
- Multiplying out brackets (a reduced size version of this **resource** is on the next page)
- Probability scales
- 2D shapes – naming and classification

The approaches used include:
- co-operative small group work
- encouraging reasoning rather than 'answer getting'
- exposing and discussing common misconceptions
- higher order questions
- rich collaborative tasks
- using technology creatively and appropriately

It is understood that further resources are to be added to the series.

The ideas in the Mathematical Moments are simple and straightforward but may nudge you into teaching a topic in a slightly different and more engaging and effective way.

We would welcome readers sharing their experiences in using any of the Mathematical Moments produced by LSIS.

Click **here** to go to the top of the newsletter.

Mathematical Moments

The LSIS STEM Programme

LSIS

Topic: Multiplying out brackets (Using rich collaborative tasks)

Objectives
- To enable learners to understand the meaning of an expression written as a pair of brackets.
- To enable learners to multiply out brackets using any combination of letters or numbers.

Materials required
- Cards made from the templates attached

Suggested activity

Write down some expressions, written as pairs of brackets, that you would like your learners to be able to expand.

What are your criteria for choosing these expressions? You may wish to consider:
- the combination of letters and numbers which will offer appropriate challenge to your learners
- the use of positive and negative numbers.

When you have selected your expressions, transfer them to the rectangle diagrams. These will form one set of cards. Some examples are included in the activity template to start you off; you might use these with learners to familiarise them with the procedure.

Write out the solutions to your chosen expressions in different ways. Enter them into the Solution Cards template. These will form a second set of cards. The solutions to the earlier examples are included as sample cards that you might use with learners to familiarise them with the procedure.

Ask learners to work in pairs to match the card sets.

How will you design your initial expressions so that learners are unable to guess the answers? How could you differentiate this activity for learners of varying ability? How could you extend and link this activity to other topics in mathematics?

Further ideas
- Session N5: Understanding the laws of arithmetic in *Improving learning in mathematics*
- Session A1: Interpreting algebraic expressions in *Improving learning in mathematics*

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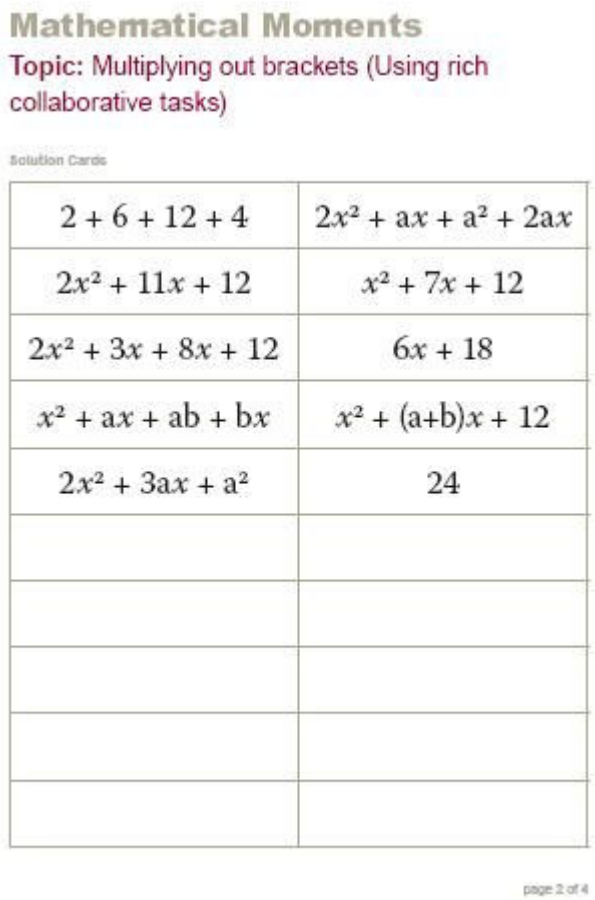

Mathematical Moments

Topic: Multiplying out brackets (Using rich collaborative tasks)

Solution Cards

$2 + 6 + 12 + 4$	$2x^2 + ax + a^2 + 2ax$
$2x^2 + 11x + 12$	$x^2 + 7x + 12$
$2x^2 + 3x + 8x + 12$	$6x + 18$
$x^2 + ax + ab + bx$	$x^2 + (a+b)x + 12$
$2x^2 + 3ax + a^2$	24

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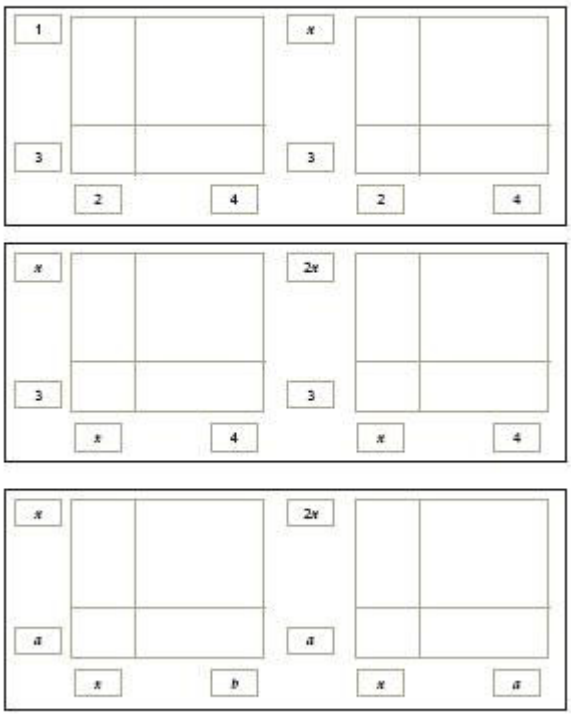
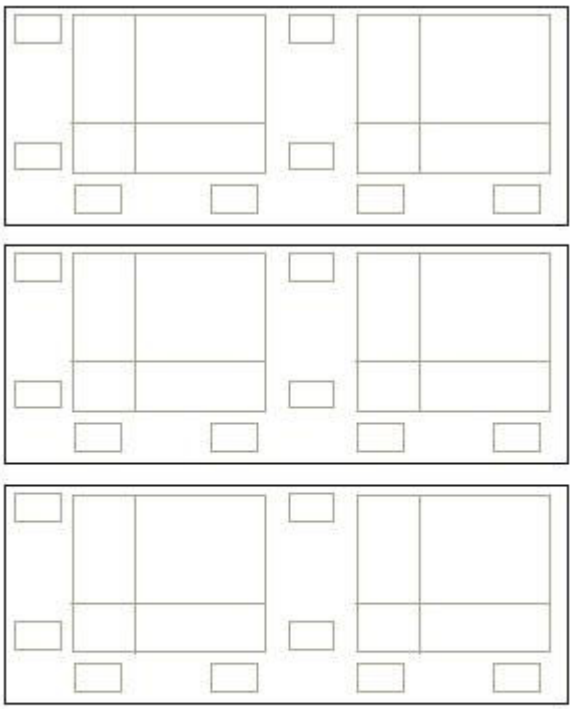
Mathematical Moments

Topic: Multiplying out brackets (Using rich collaborative tasks)





This resource is delivered by the STEM consortium as part of LSIS's Teaching and Learning Programme.
For more information visit www.excellencegateway.org.uk/STEM.

A new alternative to GCSE for post-16 learners to be launched following the successful GCSE Use of Maths pilot

Accredited by Ofqual and available for teaching from September 2011.

The **AQA Certificate in Use of Mathematics** is:

- designed to engage those who are less comfortable with abstract mathematics by focussing on the application of mathematics to relevant contexts and integrating its teaching and learning with ICT;
- available as a fresh start for students who have previously been less than successful in the mathematics classroom (post-16 students);
- both practical and relevant to the real world, training students not only in numerical skills but also in problem solving and modelling;

With a choice of FSMQs and levels this qualification provides a new way of engaging those students not ready/interested in re-sitting the same exams. Read more at the AQA website including comments from colleges who were involved in the pilot.

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… and Math Moments

Mathematical Moments is also the title of a series of posters from the American Mathematical Society that promote awareness of the role that mathematics plays in science, nature, technology and human culture. There are over eighty posters in the series (a few have specifically American interest but most are of wider relevance), some of the most recent posters include:

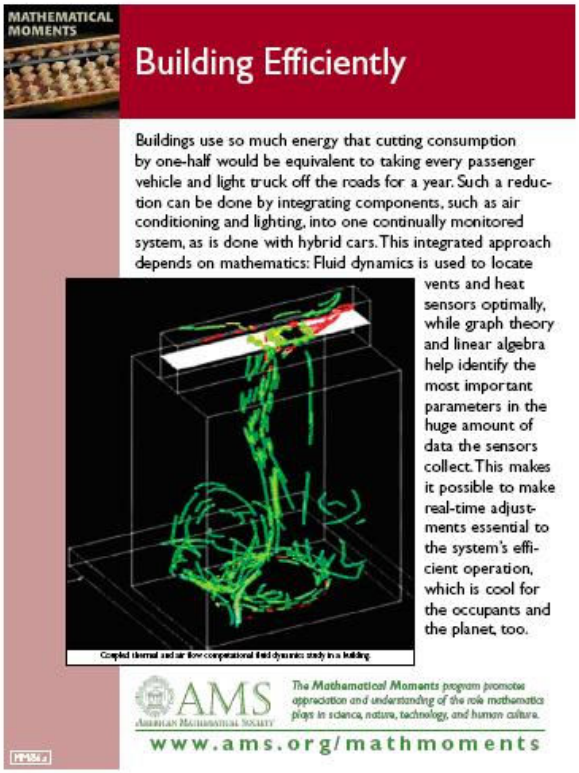
- Building Efficiently
- Adding Depth – creating 3D images
- Creating Something out of (Next to) Nothing – compressed sensing
- Getting at the Truth – investigating human rights abuses and election fraud
- Knowing How to Fold Them – understanding proteins
- Knowing Rogues – rogue waves

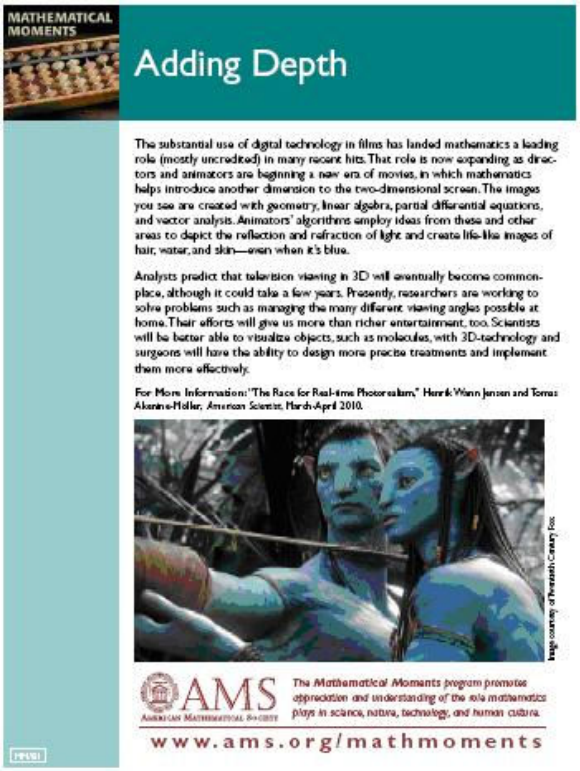
The posters do not attempt to teach the mathematics involved but to make people aware that mathematics is key to the activities featured. The posters come with alternative versions with more or less text and some are accompanied by articles and podcasts.

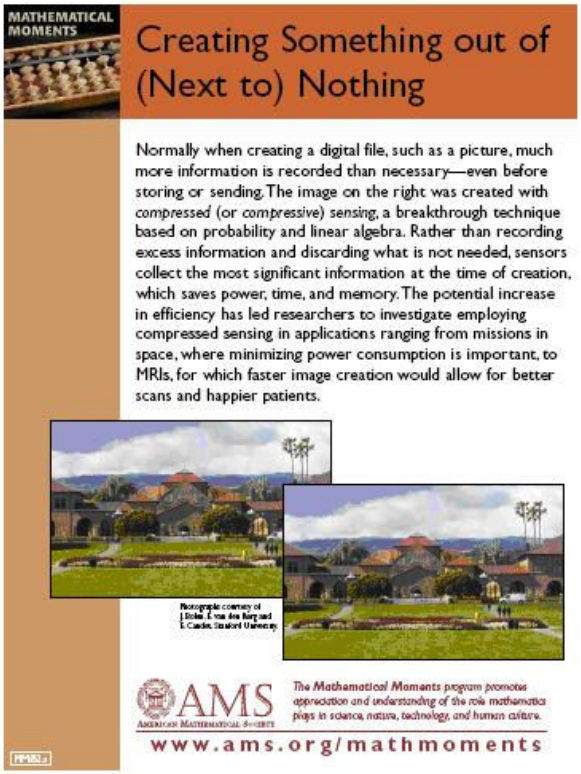
A selection of these posters, which can be printed A3 or A4 size, might make a quick and colourful (or should it be colorful) display which could be used to address the question "What is the point of learning mathematics?" There are enough posters in the series to be able to rotate displays to keep them fresh. How about putting one relevant to forthcoming work outside the door of your room or somewhere else learners congregate?

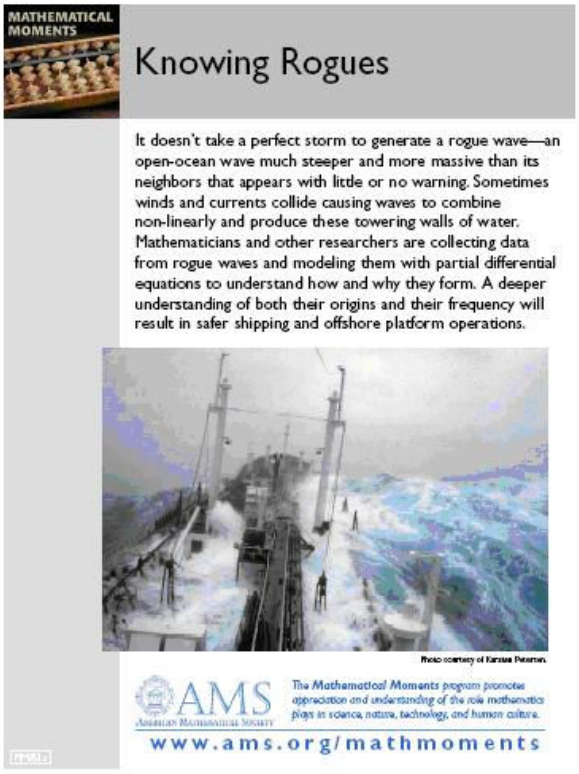
The websites of the **American Mathematical Society** and **Mathematical Association of America** might seem rather 'high-brow' but they contain some interesting resources. For example, if you were looking to connect mathematics and art then you might find useful the August 2010 issue of **AMS *Notices*** which contains an article on the work of the mathematician-sculptor Helaman Ferguson and the MAA website which has a **Found Math Gallery** of mathematical photographs.

Click **here** to go to the top of the newsletter.









Maths comes alive with *Maths in a Box*

Every maths teacher will at some point have been asked by their students "What is the point of maths?" and "Why should I carry on studying it?" Maths teachers can now get some fresh ideas on how to tackle these questions with Maths in a Box, a collection of electronic and paper resources, including posters, DVDs, booklets containing careers profiles and even a book of magic tricks and the maths behind them.

The box contains more than 50 resources which aim to encourage the uptake and further study of maths and are suitable from key stage 3 right up to key stage 5. These materials have been tried and tested in schools around England and Wales as part of the More Maths Grads project which is funded by the Higher Education Funding Council for England.

Some particular highlights in the box include a DVD featuring over 40 worksheets which show maths in a real world context and a booklet describing the purpose of topics such as geometry and algebra.

Each maintained secondary school in England should now have received a free copy of Maths in a Box at the beginning of the summer term. A similar box has also been distributed to secondary schools in Wales with the same resources in Welsh.

National Project Manager Makhan Singh said, "Maths in a Box is a vital resource for all maths teachers in secondary schools and FE colleges and also for university outreach departments. It shows that maths is used in a whole number of ways that school students may never have thought of. For example, it shows how geometry is linked to fighting cancer and how logarithms are used in our analysis of earthquakes. And at the same time, it shows how maths can be fun, as students will be able to perform - and understand - the magic tricks for themselves. Maths comes alive with Maths in a Box!".

Many of the resources are also free to download at **Maths in a Box** on the maths careers website.

If you have any questions about the Maths in a Box resource then please contact Hazel Kendrick at **hazel.kendrick@ima.org.uk**

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We are not alone

Apart from the Post-16 Group and its sponsoring organisations, others are active in providing support for teachers of mathematics and numeracy post-16. Here we highlight the professional development courses provided by MEI. Some of this provision is made through the Further Mathematics Support Programme (but don't be misled by this title as some of the FMSP provision is relevant to the Engineering and CBE Diplomas and to GCE Mathematics).

With the increase in numbers taking GCE Mathematics, there are many teachers teaching the course or particular units for the first time (or perhaps having taught it a few times and would like some further guidance).

MEI runs several **one day courses** with a series of follow-up sessions in an online classroom:

- An introduction to Decision Mathematics 1
- An introduction to Mechanics 1
- An introduction to Statistics 1
- An introduction to AS Further Pure Mathematics 1
- An introduction to OCR Additional Mathematics

Each course is intended to be suitable for all examination specifications and includes 12 months' access to extensive on-line resources.

There are also long courses, lasting over a year, for those preparing to teach GCE Mathematics and Further Mathematics: **Teaching Advanced Mathematics** and **Teaching Further Mathematics**. These courses can lead to a post-graduate certificate or contribute to credit towards a masters degree.

Also MEI runs an annual three-day **conference** for teachers each summer.

Live Online Professional Development courses are also run to cover the Advanced Diploma in Engineering and GCE units. The courses have five or ten hours of online tuition in a group with a tutor. Courses include training for Unit 8 (Mathematical Techniques and Applications for Engineers) of the Principal Learning of the Advanced Diploma in Engineering, the first two GCE units in Decision Mathematics, Mechanics and Statistics, and the GCE Mathematics Core. These online courses are particularly useful for people who find it difficult to attend courses outside their institutions.

Further details of MEI CPD can be found at **http://www.mei.org.uk/cpd**.

Click **here** to go to the top of the newsletter.

Be part of the first ever engineering mathematics networks

A unique and exciting **opportunity** has arisen for engineering mathematics practitioners to join a new networking group. This groundbreaking initiative is aimed at Engineering Mathematics Level 3 practitioners, and anyone teaching mathematics within other engineering courses, who want to seize a valuable opportunity to investigate a variety of teaching approaches, network and learn from others and explore and develop resources. Three initial events are planned: 23 November, Airbus, Bristol; 24 November, Royal Academy of Engineering, London; 1 December, University of Manchester. All events will start at 10:30, with refreshments from 10:00, and will finish at 3:30. There is no charge for attending. To reserve a place or for more information, please email **Melanie Harradine**, indicating which event you are interested in attending.

Your contributions are welcome

If you would like to comment on this newsletter or contribute to a future issue, or become involved in the work of the Post-16 Group then please **email** us.