

## Maths in a Box – a few ideas to inspire!!



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?’ The Maths in a Box resource was developed to help tackle these questions through a large collection of electronic and paper resources, including posters, DVDs and booklets. These materials were created as part of the government-funded More Maths Grads project and have been tried and tested in schools around England and Wales.

A copy of the Maths in a Box resource was sent to every maintained school in England and Wales in Spring 2010. Here are some suggestions of how the resources might be used, including quotes from teachers who have actually used the box.

# 1) Use the posters to their full potential

Teachers all over the country have been making innovative use of the posters, many of which contain detailed information on mathematical careers or applications. They are suitable not only for displaying on the wall, but for use in a variety of activities with pupils.

*"I asked pupils to do a piece of research based homework on the 'when will I ever need maths posters' - students had to come up with their own uses of maths when given an area of work."*

*Teacher - Beckfoot School, Bingley, West Yorkshire*

*"I have used the posters as starters in lesson with KS4 pupils to discuss how maths is used in the real world."*

*Teacher - Higham Lane School, Nuneaton, Warwickshire*

# 2) Use the resources to help pupils decide their next steps

The maths in a box resources are particularly useful for pupils who are about to decide on their next steps – either deciding on whether to take A-level maths or whether to take a mathematical subject at degree level. If you have a handful of pupils who are considering degree level maths, you could lend them a selection of the career booklets and a copy of ‘Maths at University’. Why not even put some of the booklets into your school or college library?

*"The DVD with interviews with real mathematicians has been lent to year 13's to look at to help them prepare for university interviews."*

*Teacher – Tile Hill Wood School, Coventry*

*"The booklet opened my mind to the opportunities available to students who do maths at university"*

*Year 13 pupil, Tile Hill Wood School, Coventry*

## 3) Use the enrichment resources

Inside Maths in a Box there is a DVD-ROM titled 'What's the Point of Maths'. If you enter the Staff Room section then there is a folder titled 'Bonus'. This folder contains all the enrichment sessions which were delivered by More Maths Grads staff in local secondary schools and colleges. Topics such as code breaking, paper folding and mathematical magic are covered. There are PowerPoint's, worksheets and teachers' guides which will enable you to deliver an enrichment session with minimal effort. Why not use these with your gifted and talented pupils, at the end of term or during a maths week?

*"The enrichment sessions aimed to show pupils that mathematics is really wide reaching with both serious and fun applications. Schools kept asking for the sessions over and over again, and it is hoped that teachers will now deliver the activities themselves."*

*Member of the Project Team, More Maths Grads*

## 4) Utilise [www.mathscareers.org.uk](http://www.mathscareers.org.uk)

**www.mathscareers.org.uk** is the on-line home of Maths in a Box. Digital copies of the Maths in a Box resources can be found on this website, so if you ever lose your box (or it wears out with over use) then you can print out more copies of the resources without having to worry about any copyright issues. There are black and white copies as well as colour copies, so you don't have to go full colour if this is difficult in your school. There are lots of complimentary on-line resources such as a careers calculator where pupils can answer questions and see which mathematical careers are personally suggested for them.

*"Visits to [www.mathscareers.org.uk](http://www.mathscareers.org.uk) are constantly growing with an average of more than 15,000 visitors per month in 2012. We want this valuable resource to be used in every mathematics classroom."*

*Website project manager – [mathscareers.org.uk](http://mathscareers.org.uk)*



## 5) Challenge misconceptions

There are lots of stereotypes and misconceptions when it comes to mathematics and mathematical careers. A good way of challenging these is through role models of successful people who are using mathematics. Maths in a Box contains a large number of videos which show people either using mathematics at work, or talking about their career path.

*"As a tutor for an all male group of engineering students, it was useful to get the students to view the videos of female engineers and multi ethnic faces in professions that the students only aspire to. By seeing the reality of the environment, it creates an achievable target. I also asked my engineering students to draw or describe what an engineer looks like before showing them the video clips. The general idea was that an engineer is male, wears a boiler suit and hard hat, and that he is always walking around with a toolbox. After the video footage it was good to challenge the perceptions, and replace tools with software and computers, replace male stereotypes with a more balanced view and replace boiler suits with business dress!"*

*Teacher – Bridge Academy, London*

*"Interesting and eye opening; I never really knew that girls did engineering; Can you tell me some more about this..."*

*Pupil – Bridge Academy, London*

*"I found the DVDs particularly useful and the postcards are a great way to answer questions that students come up with in terms of the usefulness of mathematics."*

*Lecturer – University of Hertfordshire*

## 6) If you read one thing – read the ‘What’s the Point’ booklet

Maths in a Box was inspired by a pupil asking the question – “what’s the point of studying trigonometry?” It can be hard to answer the dreaded question, especially for some topics which seem abstract or theoretical. The ‘What’s the Point’ booklet and accompanying posters give some relevant examples for many common topics in GCSE and A-level mathematics. Next time a pupil asks you ‘what’s the point of quadratic equations?’ you will have an answer up your sleeve. (Or why not keep the booklet in your desk drawer!)

*"the 'See the Maths in.....', 'When will I ever need Maths' and 'What's the point of.....' posters were just what we were looking for to help our trainee teachers prepare for the questions which their pupils, who might not share a love of mathematics, would inevitably ask."*

*PGCE tutor – University of York*

## 7) Go cross-curricular

Maths in a Box provides a perfect opportunity for a cross - curricular project involving other departments in your school. For example you could ask pupils to design a STEM careers guide, using information in Maths in a Box, combined with information provided by your science and technology colleagues.

*"We tried to display the relevant posters in different areas of school - e.g. engineering in the technology department, ICT in the ICT department"*

*Teacher, Painsley Catholic College, Stoke-on-Trent, Staffordshire*

## 8) Bring the box to life using people from beyond the classroom

Inside Maths in a Box is a copy of the STEM directory and a leaflet on the STEM ambassadors programme. Even though these hard copy leaflets are now out of date, there will always be an up to date version online. The STEM directory contains a list of organizations which provide enrichment and enhancement activities for schools, some which charge and some which are free. Under the STEM ambassadors programme, people from industry will come into your classroom free of charge. This is taking the DVD resources one step further and bringing live role models into your classroom.

## 9) Use the curriculum based resources

On the 'What's the Point' DVD, there are over 40 curriculum based worksheets which link higher tier GCSE mathematics with real world applications. This means that talking about careers and applications doesn't need to be a bolt on to your normal maths lessons, but can be an integral part of what you do!

## 10) Keep innovating!

Mathematics teachers are one of the most creative sets of people you will find – constantly thinking of innovative ways to teach a subject which is often unnecessarily feared and disliked. It is hoped that you will keep using Maths in a Box as a springboard to bringing mathematics alive for your pupils. Why not keep a scrap book of articles which use mathematics in the media, or cut outs of job adverts which require mathematics – let your imaginations run wild!

*"If our current group of trainees are as creative as previous cohorts have been (and we have no reason to believe otherwise) then their imaginations may not be limited by what the box contains. Who knows what might develop?"*

*PGCE tutor – University of York*

# And finally ....

One teacher from South Africa spotted Maths in a Box and we sent her a copy. Here is the result!

A letter from South Africa....

*"Thank you very much to you and your team for sending me a copy of your 'MATHS IN A BOX' kit.*

*I cannot explain to you how excited my students and I were when we received it. We put up all the charts in my classroom and what a difference it has made.*

*Firstly, it has made our Maths class look so beautiful, creating a wonderful learning environment. My learners are always excited to come to the Maths class because they get to work in such a beautiful setting (You know our school is not very pretty. It is quite run down and is not a very pretty setting at all).*

*Secondly, the charts are so knowledgeable and interesting to read. They bring to light, suddenly, the relevance of learning such abstract topics like trigonometry, quadratics, differentiation, etc that they have been learning all their schooling life.*

*As for the videos, they were so interesting and exciting to watch. The videos have put my learners into a different mindset altogether. They are working so hard and trying to pass and do well at Math because they want to get into one those exciting careers like engineering, medicine, forensic science, navigation, architecture, etc. They know that only hard work will make them excel at Maths, giving them a chance of winning scholarships, which previously they never even thought of applying for. Most of my learners come from previously disadvantaged backgrounds and they are well aware that only excelling in their schoolwork will get them out of this township and out into the big world".*

*Ruwaida Bhajee (NIRVANA SECONDARY SCHOOL – MATHEMATICS DEPARTMENT – Johannesburg, South Africa )*

*"In conclusion I feel that this box has a lot to offer schools and I would encourage teachers to use these resources as they are an excellent source of inspiration for our pupils to hopefully continue onto STEM subjects later in their education."*

*Head of Mathematics – Kingswood School, Bath*