# Maths Inspiration

**Teacher Feedback focus group – for use by Maths Inspiration**

**30th June 2017**

**Background**

Maths Inspiration set up the Teachers Advisory Panel (TAP) in July 2016 in order to formalise our dialogue with maths teachers. The TAP provides feedback and guides the development of the Maths Inspiration shows.

Panel members are drawn from different types of schools and colleges across England. Members can apply to join via the Teachers Page on the Maths Inspiration website. The only requirement is that they are a maths teacher and have been to at least one show. Members are acknowledged on the Maths Inspiration website and are given ten free seats to any MI show they book.

**The Focus Group**

Maths Inspiration currently has eleven TAP members. We held the focus group at the MEI conference in Keele, as we knew a number of our members would be attending the conference, and it would be less demanding on their time.

In total we had ten participants (listed below), four of them TAP members and the rest teachers, who had seen a show, that were invited while visiting our exhibition stand on the day.

**Participants**

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| Name | School/organization | Region |
| Graham Barlow  Teacher/TAP member | Tytherington School  Macclesfield | North West |
| Nicola Cologne-Brooks  Teacher/TAP member | The Royal High School  Bath | South West |
| Leona So  Teacher/TAP member | The Manchester College  Manchester | North West |
| Kath Conway  Teacher/TAP member | Bristol Free School  Bristol | South West |
| John Rhodes  Teacher | Woodhouse College  London | London |
| Varuna Gooriah  Teacher | Fortismere School  London | London |
| Anna-Marie Edmunds  Teacher | Abbey College  Cambridge | East |
| Marek Milejski  Teacher | King David High School  Mancheser | North West |
| Colin Fleming | FMSP Wales | North Wales |
| Mick Blaylock | Former Head of Core Maths | North West |

Also present were Rob Eastaway, (Director, presenter), Jill Walsh, (Associate), Colin Wright (presenter) and Ben Sparks (presenter).

**The Format**

We provided a short recap of Maths Inspiration, and then the room broke into three groups to each consider three question areas.

The questions were grouped under:

Teacher Experience

Student Experience

Show Development.

**The Questions and Feedback are summarised below:**

Comments that were made several times have only been noted once. Comments haven’t been weighted, however some points have been noted as having the strong support of the whole group.

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| Questions | Comments |
| **Teacher Experience** | |
| ***There was a unanimous feeling that attending the shows provides teachers with a career development opportunity. Teachers described the presentations giving them ideas that they use in their own teaching, watching their class to see what sections of the show resonate with them, and ‘stealing’ some of the techniques/examples that are used in the presentations. Two Heads of Maths present said they rotated which teachers attended as they thought it was such an important opportunity for their staff.***  ***When we asked for ideas to improve what teachers get out of the shows, the consensus was that we should provide more online resources linked to the shows that could be used in the classroom, and provide links to other relevant webpages.***  ***When discussing promoting the shows to new schools it became clear that word of mouth, or a recommendation from a trusted body – FMSP, Maths Hubs carries weight with teachers. There were also very practical suggestions around reviewing our publicity.*** | |
| What do you as a teacher gain from engaging with MI? | It’s interesting to see what the kids react to.  I like it when speakers go into the maths, it makes me think about how I can teach the same subject or use that approach in the classroom.  It’s important to have other voices reinforcing what I’m saying. My students didn’t really know what a maths degree is or why you’d study it; Maths Inspiration changed their minds, and opened their eyes to other possibilities. |
| Do you get any career professional development (CPD) from attending the shows? | Yes, I see attending the shows as helping me to develop my own teaching style and ability.  I find it interesting to see what the kids react to in the presentations, I use it to inform and develop my own teaching. I use the same content, sometimes the same gags in other situations, e.g. when teaching a different group who didn’t attend.  I think it’s so important that I rotate what teachers go to the show, to make sure they can all benefit over time. |
| How could MI and our partners improve what teachers get out of the shows? | Provide links and resources that relate to the presentations that we can use in the classroom.  Give us material that could be used in a follow-up lesson. Helps if it links to the curriculum but it doesn’t have to.  Provide the links to your speaker’s web pages or other online content.  We don’t have time to search the internet and find information, give us links and resources in a way that it is easy for us to see and use  Make sure that we rotate speakers.  Provide back programmes on the website so we can make sure its not a show our year group has seen previously.  Brief your speakers not to do the same presentation in the same region at different events, as some of the audience will overlap and it spoils the impact if they have already heard it.  Create a webpage of content and links for each show, which has resources, web links information about the speakers, puzzles, etc.  Provide follow resources with explicit curriculum links |
| What else could we do to support teachers to bring a large party to a show? | Change your publicity, have more show photos. Maths Inspiration and the cartoons don’t inspire students to want to come. The photos give a better idea.  The graphics aren’t giving the right message, the photos are better, they look more interesting.  Create an A3 PDF of the poster that we can download from the website and print, then we can put that up at school to create interest.  We take whole classes and build in the expectation that everyone has to attend. Its part of what we do as a year.  Get a clip, like a movie trailer that we can show to the classes, that will help get them interested.  We want to bring large parties, sometimes its difficult to get the kids to sign up to come. I tell them it’s a ‘maths panto’, which always gets them to sign up.  The cost of getting to a show can be expensive – in terms of teacher time for large parties, it’s getting harder in recent years  The cost is prohibitive for some of our students. I didn’t know about the free tickets, that actually makes a big difference.  Be aware of what facilities a venue has – e.g. The Cardiff show has a good venue, there’s lots of space for teachers and students to wait if they arrive early (eat lunch etc.). It takes us a couple of hours to travel to any show, so I always build in extra travel time, and we often arrive early. It’s hard when there isn’t anywhere to wait with thirty or forty students.  Our schools would really respond well to an offer of £200 to go towards teacher cover, or even to spend as we want.  Schools like to feel like they are getting a bargain, offering discounts or free seats helps to motivate schools to come. |
| What should we do to attract new schools to Maths Inspiration? | Ask teachers to recommend it to their colleagues in other schools.  Use a Youtube clip to promote MI and explain what it is.  Have interviews with speakers and audience members on your website that we can play in class.  Work more closely with the maths hubs, ask us who you should be contacting  Make sure you have maths teacher addresses for your publicity, not the school generic email as we don’t tend to get information forwarded  Get new schools to see a show, by inviting teachers to come and see a show. More likely in the summer term as its easier for teachers to be released then.  Build links the with the outreach people in academy chains, often academies will have someone who will decide on what trips etc. should be undertaken.  Give flyers to other maths bodies/people that teachers work with/trust  (UK MT and Angela Gould) |
| Conclusions/actions Create plan for online resources/web links to support the shows  Outreach plan which identifies individuals and maths bodies  Review mailing list  Review publicity leaflets | |

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| **The Shows** | |
| ***There was agreement that the half-day show with a three sections, two maths and one - engineering, statistics, related element worked really well.***  ***There was a lot of discussion about who would benefit from them. Most thought MI had pitched it correctly at a GCSE grade 6 (roughly B) or above. Some thought others would still get something out of the shows. Teachers thought that MI shows linked to the curriculum, but we may need to signpost that more, and on follow-up material. Some thought that it was important to have elements that didn’t link to the curriculum, that existed for the fun of it.*** | |
| Which shows or elements of shows work best? How important is it to have a star speaker? Does a ‘star speaker’ make it more attractive for teachers and or pupils? | Give us information about the speakers, links to their websites/Youtube channels and books etc. But we don’t want a ‘hard sell’ to get us to buy things.  Mi presenters are role models; we need to have different types of mathematicians speaking.  The shows work best when:  Its personal  There’s novelty  There’s magic  Audience participation  In other words, all the elements of good theatre.  Star speakers do sway me when considering booking.  We come regardless of whom the speaker is, we notice that a lot of your speakers are now on TV and have books out.  It’s really powerful when somebody from my school is asked to volunteer on stage – the class always remember that later and it’s a talking point among the students  What’s better a half day or full day event? On balance half day is better – it’s easier to get a class to go and sometimes less is more. |
| Are the presentations linked closely enough to the National Curriculum? What content should we consider for future shows? | Yes, but could be made more explicit.  This is more important for less advanced mathematicians.  Yes, it’s done really well.  I think it’s valuable even if it doesn’t link to the curriculum. |
| Are we pitching our shows at the right audience?  Currently: Shows for year 9/10’s – all  Shows for year 11’s 12’s – all with potential to get GCSE grade 6 or above, or doing core, A/S, further or A level maths | Sometimes it’s hard to know who to bring. It’s easy to bring those who are keen, but others will get benefit out of it too.  We tend to bring our middle set (rather than top set) as they’re often more in need of inspiration, and seem to get a lot out of the show.  The maths needs to be more linked to the curriculum for the GCSE’s grade 6/7 to be able to understand it.  It’s quite varied, as it also depends on what they are interested in. Some kids will understand one subject really well, but might not grasp another in the same way.  We think the shows have something for everyone, some of them like the real-life/work bit more than the maths bit, or vice versa, but the mixture works really well. |
| Should we make more of the puzzles? Should we make the interval ‘puzzle challenge’ more of a feature? | Create a puzzle booklet that linked to the show that they can do on the way home, just an A4 folded, with some information re links and u tube videos on it too.  MI should develop an app that can be downloaded with MI puzzles on it. Could be updated.  Some students really take it in and want to go away and do more.  A puzzle or a challenge during the interval is a great idea, they like having something to do.  Give the students a puzzle booklet that is linked to the show that they can do on the coach on the way home. |
| Conclusions/actions  Create a puzzle booklet linked to the show that can be given out.  Make links to the National Curriculum more explicit when they exist. (link to our comms).  Review how the shows link to the curriculum, partic in relation to students at grade 6/7 level. | |

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| **Student Experience** | |
| ***The consensus is that Maths Inspiration does influence young people by providing a positive image of maths and mathematicians, creating a positive association outside of the classroom, providing practical information and examples of careers and by engaging them in maths through the shows.***  ***The engineering elements of shows were discussed at length, with agreement that it was a popular element of the show, which influenced pupils. There were several examples within the focus group of pupils who had decided to study engineering after seeing a show.***  ***However it was felt that there is a complex mixture of elements that influence young people in their studies and relationship with maths. The fact that the shows are held in theatres, are high-energy events, with presentations, laughter, interaction and spectacle facilitate by a range of speakers makes them extremely memorable. Teachers reported that shows are talked about throughout the year, suggesting that they have a longer-term positive impact.*** | |
| Are we reaching and influencing reluctant mathematicians? | Some of our kids are reluctant to come to the show. We promote it as a whole class activity, and build an expectation that everyone comes. They all seem to enjoy it.  Our older students tend to sell it to the younger ones, and create a ‘buzz’ that this is a good thing that we all do.  I tend to bring those who are most interested, as sometimes it’s hard to get the kids who are less interested to come along.  There’s no doubt in my mind that the presenters are role models for our pupils. It’s great to see so many women presenters, I notice that’s something you’ve been working on.  You need to have a range of different presenters because they are role models and you want someone that most kids can relate to, for this you need different types of mathematicians.  Yes, but you want to start influencing them before year 11. |
| What impact does attending our shows have on teenagers opting to take Maths A Level, or study maths beyond A Level? | I like the show structure, my students aren’t always interested in studying maths, but are really interested in engineering, economics or other maths areas. The shows have really opened their eyes to other possibilities.  Further maths students who have attended the shows, tell the AS maths students and then they want to come. Maths suddenly becomes more interesting because they’re all talking about it.  When one girl who wasn’t that interested in maths, decides to study it at ‘A’ Level (after seeing a show) it influences others in her own year and further down the school.  There is a mix of factors which lead young people to study maths, but I am certain that MI is part of that mix. |
| How do our shows raise the awareness of engineering among the attendees? | Lots of our girls came back from a show with Paul Shepherd really enthusiastic about engineering. This is a group who hadn’t thought of it before.  The engineering elements are favorites, when they talk about projects it is very inspiring and engaging. Lots of kids don’t think about how the maths can link to engineering. When they hear about the roller coaster, the dam buster, in their minds something real is happening and they make the connection.  The engineering speakers have caught the interest of one or two students every year, and have prompted them to seriously consider engineering as an option. These students probably wouldn’t have considered going to a specific engineering event, as they didn’t think they were interested in it!  The link between maths and engineering is often a talking point in school after the shows.  Lots of the kids like different bits of the shows, and that’s why the shows work because there is usually something for everyone. A lot of our kids like the engineering section. I don’t think they would want to sit through a whole engineering show.  Lots of students enjoy maths, but don’t know what to do with it. Engineering gives them ideas. It gives them physical examples of things. Its not just engineering, one show had an animation section, it made the students see how many options maths can give them.  Our kids like the maths element, and then find the engineering speaker really interesting; they seem to work well together.  I like the way the maths links to the engineering. A show called ‘engineering inspiration’ wouldn’t work. It would only attract the ones who already know about engineering.  The maths, engineering and STEM connections become obvious when engineers speak. |
| Do you link the MI shows to stem education or careers activities you undertake with students? | Sometimes, but its not always the teacher who brings them who will talk to them about STEM and careers.  A follow-up activity, webpage/links would help with this, as it would be less reliant on the teacher who saw the show.  The links to STEM and careers are easier for the students to see on stage, it has more impact coming from someone as part of a show.  You should create some resources that link to the careers/engineering section that we can use in the classroom |
| Conclusions/actions  Stem resources in line with earlier comments re resources pages. | |
| There was also other information that came out of the discussions, which went beyond the questions that we asked, but was still useful to collect. It is summarized below. | |
| **Other information collected (not specifically asked)** | Free teacher places are important and help when releasing teachers.  It’s easier for teachers to be released for summer shows than at other times of the year.  A show linking to computer science would be helpful, there is a push to promote the uptake of computer science.  We should promote our own clips more and make more of what we already have.  Schools love a ‘freebie’ with sponsorship/partners can pay for teacher cover, or other aspects of the trip, this would be popular (although limited).  Most schools now ask their pupils to pay the ticket price; if a pupil has pupil premium the ticket may be paid out of that. Ticket price tends to be a problem for low-income households where parents are working but on low incomes.  Very split reaction to the ticket price, for most its very reasonable but for a minority of students it is out of reach.  Most schools don’t realise that we have free seats.  Avoid shows close to the end of term, avoid Mondays and Fridays. Mornings are easier, unless travelling significant distance in which case afternoons are.  Liaise with SLT for curriculum links  Some teachers make coming on the trip compulsory. |
| **Conclusions/actions**  Look at programming shows more carefully (day of week etc.)  The tickets price is affordable for most, but not all; it varies a lot across the country and depending on the catchment of the school. We should make discounts and free seats available and promote more so schools are aware.  We should look for other subjects that link to maths that can be showcased in the ‘real life’ section, computer science was mentioned and others. | |